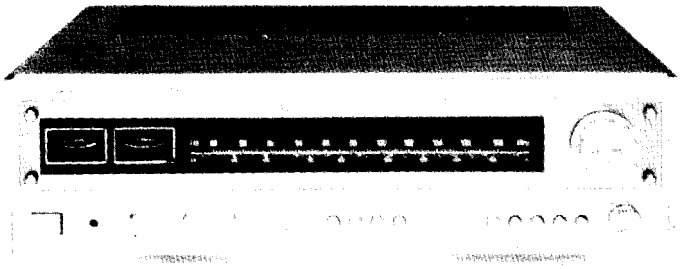
ONKYO® SERVICE MANUAL

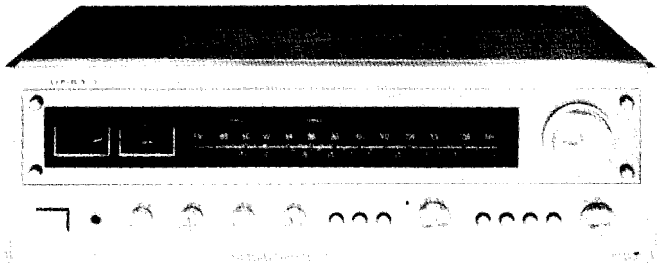
QUARTZ LOCKED

STEREO RECEIVER
TX-4500



SERVO LOCKED

STEREO RECEIVER
TX-2500



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ONKYO®
AUDIO COMPONENTS

SPECIFICATIONS

MODEL TX-4500 QUARTZ LOCKED STEREO RECEIVER

Power Supply Rating	AC 120 Volts 60 Hz
Controls	POWER SPEAKERS (OFF, A, B, C, A + B, A + C) SELECTOR (AM, FM AUTO, PHONO 1, PHONO 2) TAPE MONITOR 1, 2, & 3 TUNING, VOLUME, BALANCE, TREBLE, BASS, DOLBY FM ADAPTOR, FM MUTING/LOCK, LOUDNESS, MODE, FILTER HIGH & LOW
Antennas	FM: 300Ω balanced, 75Ω unbalanced AM: Built in ferrite core antenna and external terminal
Outputs	SPEAKER A, B, & C, HEADPHONES TAPE REC OUT 1, 2, & 3, FM DOLBY OUT, PRE OUT, FM 4CH OUT
Inputs	PHONO 1 & 2, TAPE PLAY 1, 2 & 3, DOLBY IN, MAIN IN FM AND AM ANTENNA
Dimensions	21-3/16"W x 6-7/16"H x 16-15/16" D (max) 583 mm W x 163 mm H x 430 mm D
Weight	36.5 lbs. 16.6 kg
Cabinet	Walnut grained vinyl over lauan plywood
Semiconductors	1 FET, 70 transistors, 8 ICs, 59 diodes

Amplifier Section

Power Output	65 watts per channel, min. RMS, at 4 ohms both channels driven from 20 Hz to 20 kHz, with no more than 0.1% total harmonic distortion. 55 watts per channel, min. RMS, at 8 ohms both channels driven, from 20 Hz to 20 kHz, with no more than 0.1% total harmonic distortion. 75 watts per channel, min. RMS, at 4 ohms both channels driven 1 kHz, 0.1% THD. 60 watts per channel, min. RMS, at 8 ohms, both channels driven, 1 kHz, 0.1% THD
Total Harmonic Distortion	0.1% at rated power 0.08% at 1 watts output
IM Distortion	0.3% at rated power 0.1% at 1 watts output
Damping Factor	50 (8 ohms 1 kHz 10 watts)
Frequency Response	15-30,000 Hz (±1 dB) 2-80,000 Hz (±1 dB at main amplifier)
Tilt (sag)	better tnan 5% at 50 Hz.
Sensitivity and Impedance	PHONO-1/2:2.5mV, 50 kohms Tape Play -1/2/3:150 mV 50 kohms. TAPE REC -1/2/3:150 mV 50 kohms DOLBY OUT : 150mV 50 kohms DOLBY IN : 580mV 50 kohms PRE OUT : 1 V 3 kohms MAIN IN : 1 V 100 kohms
Phono Overload	200 mV RMS 1 kHz 0.1%
Bass Control	±10 dB at 100 Hz
Treble Control	±10 dB at 10 kHz
Signal to Noise Ratio	PHONO: 65 dB (IHF C NETWORK) TAPE: 80 dB (IHF C NETWORK)
Filters	High: 6 kHz (6 dB/oct) Low: 100 Hz (6 dB/oct)

Tuner Section

Tuning Range	FM: 88-108 MHz AM: 530-1605 kHz
Usable Sensitivity	FM: Mono 1.8μV (10.3 dBf) Stereo 5μV (19.2 dBf)
50 dB Quieting Sensitivity	FM: Mono 4μV (17.2 dBf) Stereo 40μV (37.2 dBf)
Intermediate Frequency	FM: 10.7 MHz AM: 455 kHz
Capture Ratio	FM: 1.5 dB
Image Rejection Ratio	FM: 70 dB AM: 40 dB
IF Rejection Ratio	FM: 100 dB AM: 40 dB
Signal to Noise Ratio	FM: 70 dB (mono) 65 dB (stereo) AM: 40 dB
Alternate Channel att.	FM: 70 dB
AM Suppression Ratio	FM: 50 dB
Harmonic Distortion	FM: 0.2% (mono) 0.4% (stereo) AM: 0.8%
Frequency Response	FM: 30–15,000Hz +0.5, -2 dB
Stereo Separation	FM: 40 dB at 1 kHz 30 dB at 100-10,000Hz
Muting Level	FM: 4μV (17.2 dBf)
Stereo Lamp Level	FM: 4μV (17.2 dBf)
Quartz Lock Level	FM: 4μV (17.2 dBf)
Tuning Meters	Signal Strength & Center Tuning

Specifications and features are subject to change without notice for improvement.

SPECIFICATIONS

MODEL TX-2500 SERVO LOCKED STEREO RECEIVER

Amplifier section

Power Output	27 watts per channel, min. RMS, at 8 ohms, both channels driven, from 40 Hz to 20 kHz, with no more than 0.5% total harmonic distortion.
	34 watts per channel, min. RMS, at 4 ohms, both channels driven, from 40 Hz to 20 kHz, with no more than 0.5% total harmonic distortion.
	(30 watts per channel, min. RMS, at 8 ohms both channels driven, 1 kHz, 0.5% THD.)
	(40 watts per channel, min. RMS, at 4 ohms both channels driven, 1 kHz, 0.5% THD.)
Total Harmonic Distortion	0.5% at rated power
	0.2% at 1 watt output
IM Distortion	0.5% at rated power
	0.3% at 1 watt output
Damping Factor	40 (8 ohms 1 kHz 10 watts)
Frequency Response	20 – 30,000 Hz (±1 dB)
	2 – 60,000 Hz (±1 dB at power amplifier)
Tilt (sag)	better than 5% at 50 Hz.
Sensitivity and Impedance	PHONO: 2.5 mV 50 kohms
	TAPE PLAY: 150 mV 50 kohms
	TAPE REC: 150 mV 50 kohms
	DOLBY OUT: 150 mV 50 kohms
	DOLBY IN: 580 mV 50 kohms
Phono Overload	150 mV RMS 1 kHz 0.5% THD
Bass Control	±10 dB at 100 Hz
Treble Control	±10 dB at 10 kHz
Signal-to-Noise Ratio	PHONO: 65 dB (IHF C NETWORK)
	TAPE: 80 dB (IHF C NETWORK)
Filter	6 kHz

Tuner section

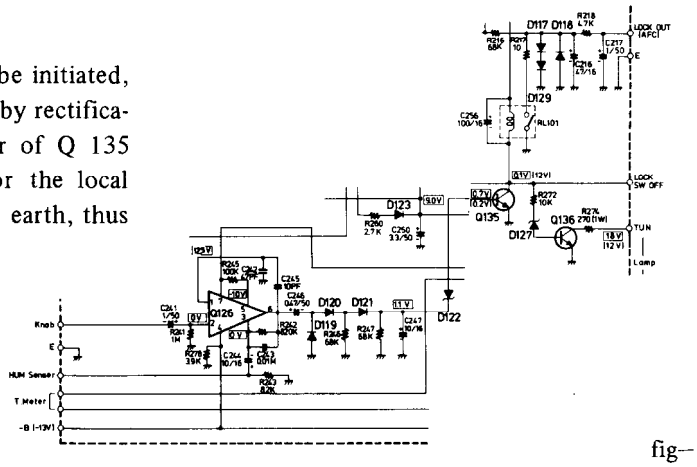
Tuning Range	FM: 88 – 108 MHz
	AM: 530 – 1605 kHz
Usable Sensitivity	FM mono: 2μV (11.2 dBf)
	FM stereo: 5μV (19.2 dBf)
	AM: 25μV
50 dB Quieting Sensitivity	FM mono: 4μV (17.2 dBf)
	FM stereo: 40μV (37.2 dBf)
Intermediate Frequency	FM: 10.7 MHz
	AM: 455 kHz
Capture Ratio	FM: 2 dB
Image Rejection	FM: 45 dB AM: 40 dB
IF Rejection	FM: 80 dB AM: 30 dB
Signal-to-Noise Ratio	FM mono: 65 dB
	FM stereo: 60 dB
	AM: 40 dB
Alternate Channel att.	FM: 60 dB
AM Suppression	FM: 50 dB
Harmonic Distortion	FM mono: 0.2% AM: 0.8%
	FM stereo: 0.4%
Frequency Response	FM: 30 – 15,000Hz +0.5, -2 dB
Stereo Separation	FM: 37 dB at 1 kHz
	30 dB at 100 – 10,000 Hz
Muting Level	FM: 4μV (17.2 dBf)
Stereo Lamp Level	FM: 4μV (17.2 dBf)
Locking Level	FM: 4μV (17.2 dBf)
Tuning Meter	Signal Strength & Center Tuning

Specifications and features are subject to change without notice.

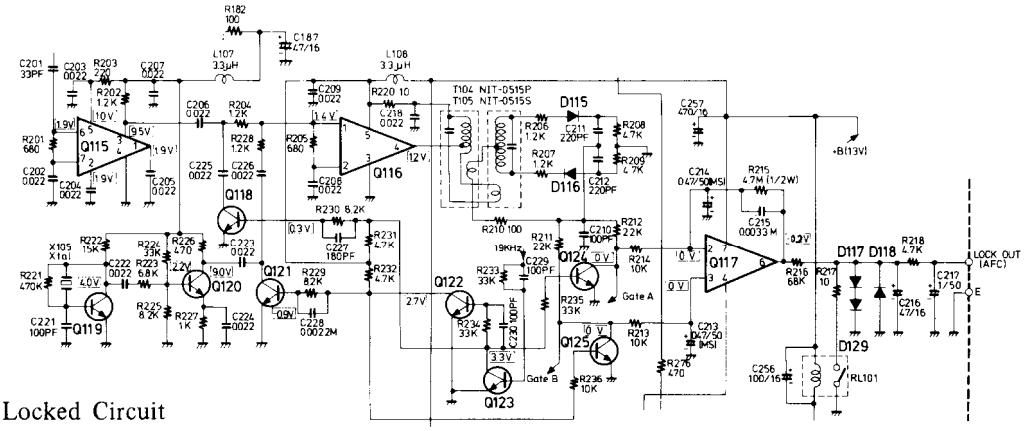
CIRCUIT DESCRIPTION

1. Tuning Knob

Touch of the tuning knob causes the ham to be initiated, which, in turn, is amplified at Q 126, followed by rectification at D 119, and 120, while the transistor of Q 135 allows passage thereby causing the signal for the local oscillation frequency regulation to drop to the earth, thus leading to a perfect tuning.



fig–1



fig–2

2. Quartz Locked Circuit

The IF component of the quadrature detector output of Q 102 and the quartz oscillation signal at 10.7 MHz of Q 119 are detected with the cycle of 19 KHz, and the variance of the detected output is amplified with the DC voltage being imparted to the variable capacitance diode at the front end. In this way, the local oscillation frequency is regulated.

(Circuit Performance)

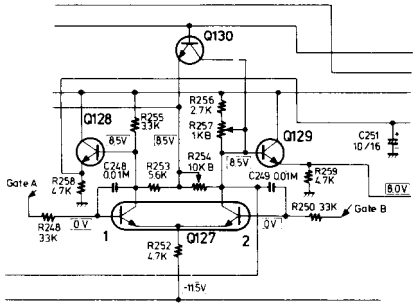
Q 123 is set to ON–OFF motions with the rectangular waves at 19 KHz inducted from No. 10 terminal of Q 103 of MPX IC at the cycle of 19 KHz.

In case Q 123 is set to ON position, Q 118 and 124 are turned OFF, and the IF signal is amplified by Q 116, detected at T 104 and 105 and added to No. 2 terminal of Q 117.

Q 122, on the other hand, is turned OFF as Q 123 is set to ON position, with Q 121 and 125 being also turned ON to cause the quartz oscillation signal (10.7 MHz) to precipitate to the earth. Conversely, when the Q 123 is turned OFF, the switching transistors (Q 118, 121 – 125) perform functions in complete reversal to the above, with the quartz oscillation signal amplified by Q 116, detected in turn at T 104 and 105, added to No. 3 terminal of Q 117, resulting in the fall of the IF component to the earth.

The preceding performance repeats itself at 19 KHz, amplifying the input variance (between the IF signal and the quartz oscillation signal) with the OP amplifier of Q 117, which is then caused to pass the low-pass filter, to be imparted to the variable capacitance diode. In this manner, the local oscillation frequency is regulated.

The deviation from center of the detector transformers T 104 and T 105 will be registered alike with both transformers and will have no relationship whatsoever with the AFC input.



fig–3

3. Tuning Meter Circuit

The IF signal and the quartz signal detected at the 19 KHz cycle are added to the bases 1 and 2 of Q 127. Since the voltage at the bases 1 and 2 of Q 127 are equal to each other at the time of tuning, the voltage at the bases of Q 128 and 129 (OV) will also be equivalent to each other, thereby causing the T-meter to point to the center.

In the event the IF frequency is on a higher level than the quartz frequency, the T-meter is caused to swing to the left as the voltage at the base 1 of Q 127 is higher in this case than that at the base 2, and at the same time, same at the base of Q 128 is registered at a lower level than at the base of Q 129. Incidentally, R 257 and R 254 are the semi-fixed volume designed to regulate the T-meter center and the breadth of the same, respectively. In addition, Q 130 is designed to avert any error in performance by shortcircuiting the T-meter at the time of detuning.

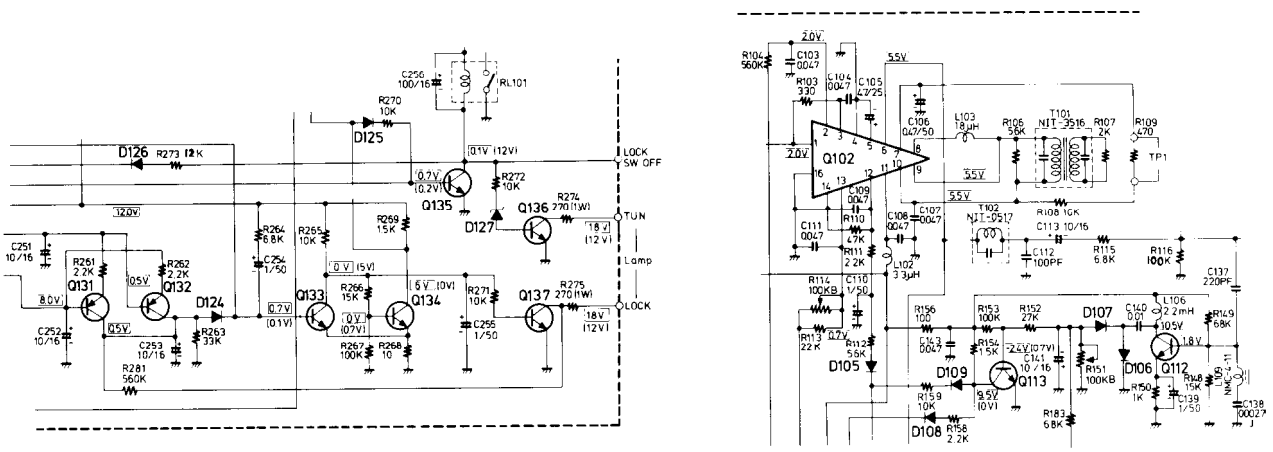


fig--4

4. Muting Circuit

The muting circuit is operated through utilization of functions of the IF carrier, the 0-point detection (variance in detected waves between IF and Quartz) and the noise component.

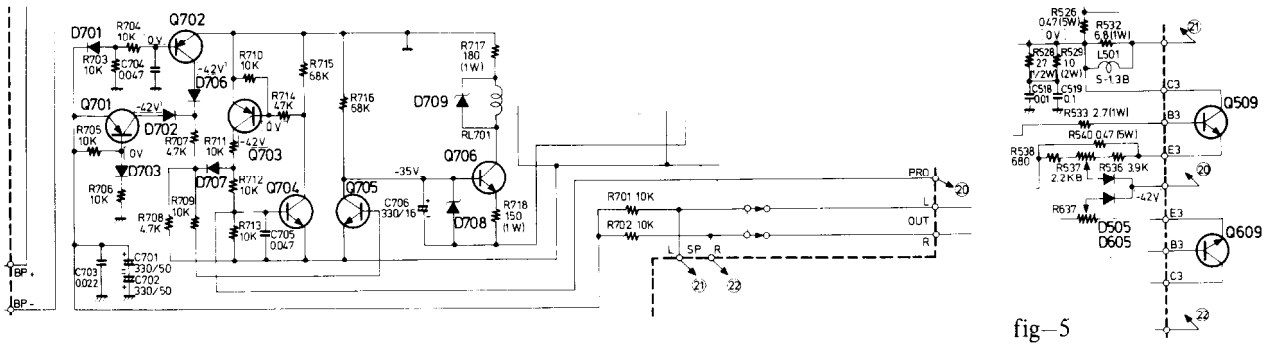
(At time of tuning)

For reasons that the base potential of Q 128 and 129 is in the state of 0V in terms of direct current as can be noted from the description given of the T-Meter Circuit at the time of tuning, the emitter potential of Q 128 and 129 is rendered equal to each other. As for Q 131 and 132, these are cut off to cause 0V output to be brought forth. At the same time, the IF carrier portion, at the time of tuning, is at a lower level in voltage than the standard level for the Schmitt trigger of Q 133 and 134 as muting regulating output inside the quadrature detector IC. For this reason, Q 133 is turned OFF while Q 137 is turned ON, which, in turn, causes Q 109 and 110 to be turned OFF.

(At time of detuning)

When the voltage of the 0-point (the variance in output between the IF detector and quartz detector) has turned positive or negative, if it come to stay on the plus side, for instance, the base potential of Q 128 is caused to drop, that of Q 129 to pick up, with Q 132 and 133 being turned ON. Again Q 109 and 102 are turned ON at the same time, with the signal being caused to drop to the earth. Again, simultaneously, Q 133 is turned ON, Q 134 OFF, Q 135 ON, causing the AFC circuit to be closed. In addition, the IF carrier portion, too, is caused to act upon Q 133, turning Q 133 ON.

Again, the L 106 resonance point is arranged at a higher level as the noise portion enters into the Q 112 base, so that Q 112 may act on the noise amplifier, causing the Q 113 to be turned OFF. This passes through D 109 and is added to the base of Q 131. It also passes through D 105, causing the transistor of Q 130 to be turned ON, and thus, causing, in turn, the meter circuit to be shortcircuited, thus ensuring against any error in performance.



fig–5

5. The Explanation of Protection Circuit

1. Steady function

While the B voltage is supplied to the protection circuit as the power source switch is turned on, it is so designed as to allow a lag of almost 4 seconds in the time required for the relay to be turned ON, by means of the time-constant circuit set to motion by R 716 and 706 so that a drop in the output may be prevented of the main circuit in the unsteady state.

In the steady state, transistors of Q 701 to Q 705 are cut off, so much so that the voltage at both ends of C 706 is caused to register a value of 6 by the function of R 720 and D 709, causing the transistor of Q 706 and the delay to be turned ON, bringing forth the output.
Again, D 709 is designed so as to keep both ends of the relay coil from being brought under the pressure of abnormal voltage. In addition, 1S 1554 between the base collectors for respective transistors is designed to thwart inverse current.

2. Detection of abnormal voltage

As the equivalent of 2 or more is generated at the center line of the main amplifier, there is a mixing between the right side and the left side at R 701 and 702, with the alternate current portion being cut off at C 701 and 702. In the case that the direct current generated here is negative, the current, passing through D 701, is broken up into partial pressure, acting on the base of the transistor at Q 702, which, in turn, causes Q 702 to open up allowing the current to pass through in the sequence of D 706 — R 707 — R 708.

As a result, the portion of voltage generated by R 708 is caused to be reinforced to Q 705, rendering the transistor to be turned ON. This, in turn, causes the voltage of the collector at Q 705 to fall, thus making the base potential of Q 706 go deeper into the negative side and turning the Q 706 OFF. This in turn causes the relay to be turned OFF, and also, the output circuit to be cut off.

In the event the base potential is on the positive side, the similar function takes place within the loop of Q 721 — D 202 — R 707 — R 708.
By eliminating a cause or causes for DC generation at the center line, the relay is caused to turn ON by the function staged in reverse order of the description given, causing the proper function to start automatically.

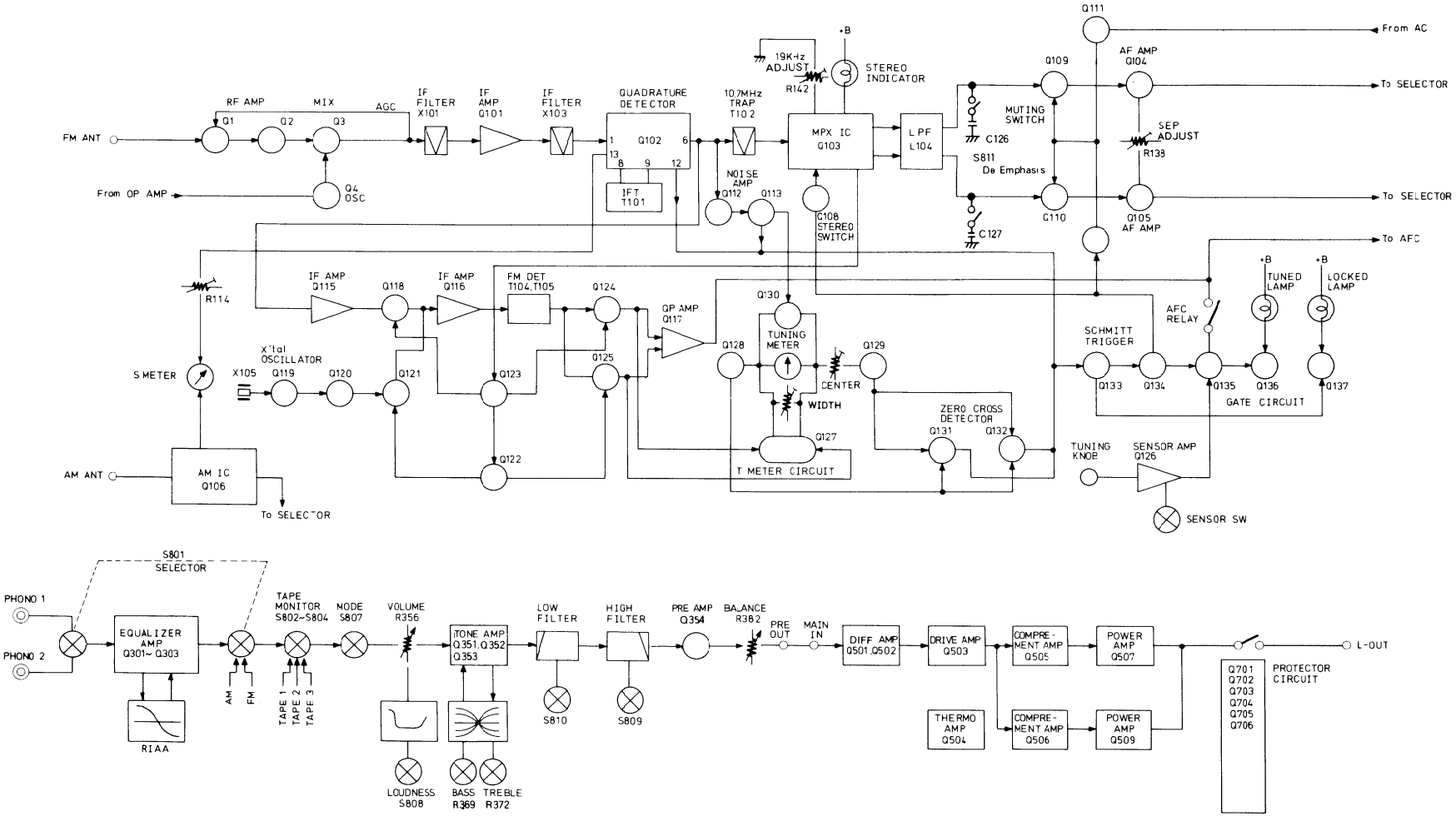
3. Detection of abnormal current

When the abnormal current is generated on the driver stage (power stage) of the main amplifier, the voltage is detected by the collector resistance and added subsequently to semi-solid resistance R 537 and 637 which are designed for current detection in the protection circuit. (The semi-solid resistance is set to function with the adequate flow of current causing the protection circuit to start operating. Refer to the Chapter dealing with Adjustment.) By the voltage reaching Q 704 by way of D 536 and D 636, Q 704 is caused to be turned ON while R 705 witnesses a voltage drop, resulting in Q 703 being turned ON.

As a result, the current flows in the sequence of Q 703 — R 711 — D 707 — R 708, and by the voltage generated at R 708, Q 705 is turned ON while Q 706 is turned OFF, causing the relay, in turn, to be turned OFF, thereby cutting off the output circuit. By the voltage added to the base of Q 704 through R 713, on the other hand, Q 704 is turned ON and on account of this, the lock circuit is set to work by Q 704 and Q 703, causing the realy to be kept in the OFF state.

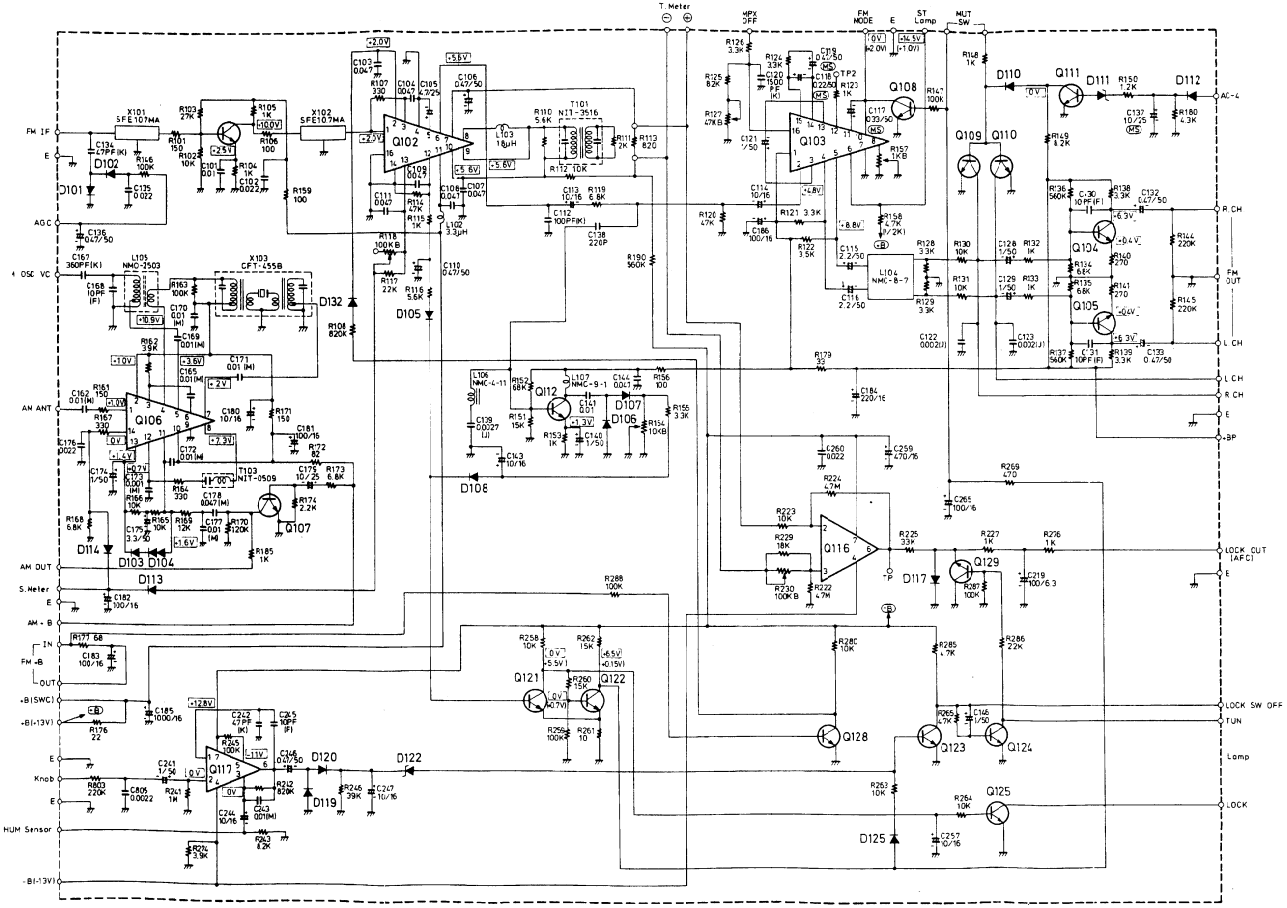
In the event a large current flows into the transistor of the main circuit, the said circuit is caused to start functioning, locking up the amplifier output in the OFF state. For this reason, it is necessary for the power source to be cut off before setting out to remove the cause for abnormal current. Turning the power source back on will set off the normal function. It should be noted that turning the lock circuit on immediately after the power source was turned OFF will not lead to a spontaneous release of the lock-up, and therefore, it must be assured that the lock circuit is turned ON a few seconds after the power source has been turned OFF.

TX-4500 BLOCK DIAGRAM



fig–6

TX-2500
FM/AM SCHEMATIC DIAGRAM(Change Parts)
NAIMX-345



NOTES
ALL RESISTORS ARE IN OHMS, 1/4WATT UNLESS OTHERWISE NOTED.
ALL CAPACITORS ARE IN μF, 500WV UNLESS OTHERWISE NOTED.
ELECTROLYTIC CAPACITORS (—|(+)|—) ARE IN μF/WV.
VOLTAGE (MEASURED WITH V.T.V.M)
[v] DC VOLTAGE (NO INPUT SIGNAL).
(v) DC VOLTAGE (FM STEREO)
PUT "K" MARK AT THE BACK OF SERIAL NUMBER AFTER A CHANGE.

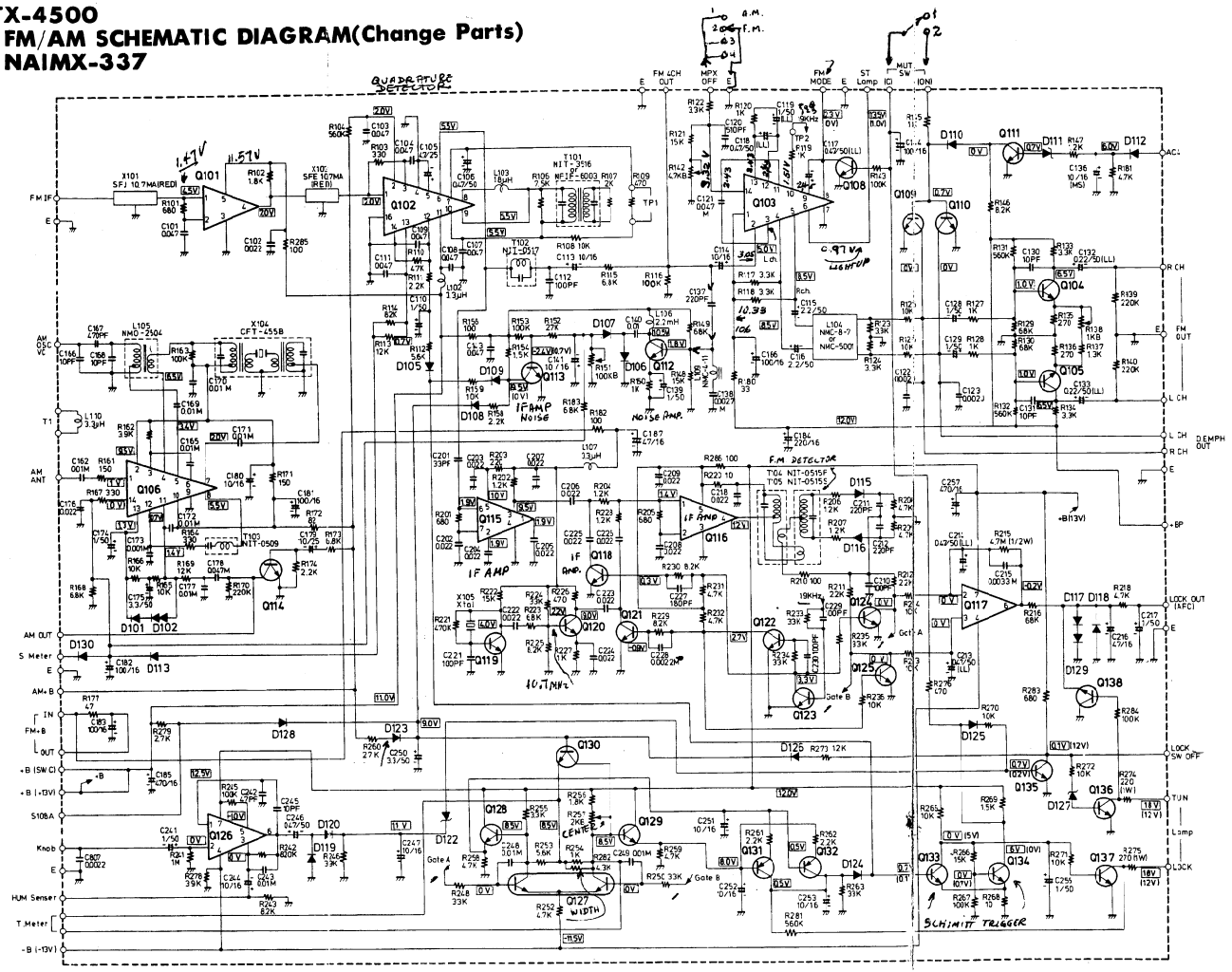
SERVO LOCKED CIRCUIT ALIGNMENT

1. Set MUTING switch to off.
2. Set the radio dial to center needle deflection on tuning meter when the FM program source is received.
3. Set MUTING switch to on.
4. Adjust R230 to center needle defection on tuning meter.

FM/AM PC BOARD(NAIMX-345)-PARTS LIST

CIRCUIT NO.	STOCK NO.	DESCRIPTION
TRANSISTORS		
Q101	2210123	2SC380 (O), FM IF Amp.
Q104, Q105	2210136	2SC1312 (F), Audio Amp.
Q107, Q111	2210046-1 or 2210045	2SC732 (BL) or 2SC732 (GR) or Transient Killer
Q108	Same as above	Same as above Mono-ST. Switch
Q109, Q110	2210244 or 2210943	2SC735 (Y) or 2SC1317 (R) or Muting
Q112	2210086	2SC733 (BL), Noise Amp.
Q121, Q122	2210244 or 2210943	2SC735 (Y) or 2SC1317 (R) or Schmitt Trigger
Q123		Gate Circuit
Q124	Same as above	Same as above Tuned Lamp Switch
Q125		Locked Lamp Switch
Q128	2210085	2SC733 (GR),
Q129	2210085	2SC733 (GR), AFC Switch
ICs		
Q102	222421	HA-1137 Quadrature Det.
Q103	222449	LA-3350 MPX
Q106	222418	HA-1151 AM
Q116	222424	TA-7504S OP Amp.
Q117	222423	TA-7136P Hum Sensor Amp.
DIODES		
D101, D106, D102 D107, D108, D110, D112-D114 D119, D120	2231031	1(N)60(N)FM
D103, D105, D117, D125, D132	223105	1S1555
D104	4000022	VD-1212, Varistor
D111	223945 or 224012	RD5.1EB or WZ-052
D122	223943 or 224011	RD4.7EB or YZ-047
COILS		
L102	223105 or 233024	NCH1005 or NCCH-1501
L103	233074	NCCH-1506
L104	233032 or 233104	NMC-8-7 or NMC-5001
L105	232013	NMO-2503
L106	233018	NMC-4-11
L107	233031	NMC-9-1
TRANSFORMERS		
T101	233101 or 233083	NFIF-6003 or NIT-3516
T103	232041	NIT-0509
CERAMIC FILTERS		
X101, X102	3010007, 3010006 or 3010008	SFE10.7MA (Blue) SFE10.7MA (Red) SFE10.7MA (Orange)
X103	3010012	CFZ-455B
VARIABLE RESISTOR		
R118	5225013	R-HK100KB3P
R127	5225019	R-H4.7KB3M
R154	5225017	R-HK10KB3P
R157	5225024	N10HR1KBD
R230	5225013	R-HK100KB3P

TX-4500
FM/AM SCHEMATIC DIAGRAM(Change Parts)
NAIMX-337



Q101,Q116 ---------- TA7060P
Q102 ---------- HA1137
Q103 ---------- HA1156W
Q104,Q105 ---------- 2SC1312(F)
Q106 ---------- HA1151
Q108,Q111,Q114 ---------- 2SC945(O)Q
Q109,Q110,Q118,Q130 ---- 2SC1317(R) or 2SC735(Y)
Q121-Q125,Q133-Q138
Q112,Q113,Q128,Q129 ---- 2SC733(BL)
Q115 ---------- TA7061AP
Q117 ---------- TA7504S
Q119,Q120 ---------- 2SC380(O)
Q126 ---------- TA7136P
Q127 ---------- 2SC1583G
Q131,Q132 ---------- 2SA726(F)

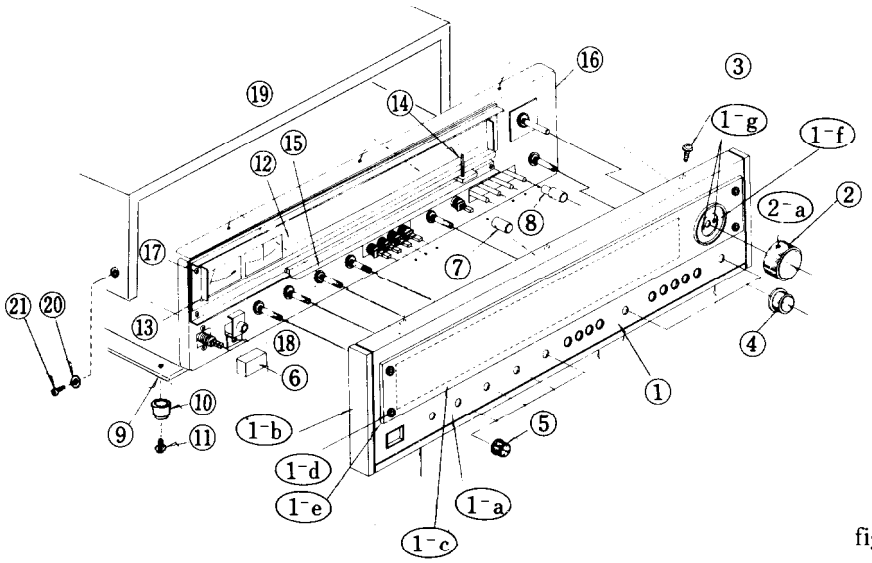
D101,D105,D110,D118,D124,D125,D128 ---- 1S1555
D102 ---------- VD1212
D106-D109
D112-D117,D119,D120
D123,D126,D129 ---- 1N60
D111 ---------- WZ051 or RD5.1EB
D122 ---------- YZ047 or RD4.7EB
D127 ---------- WZ061 or RD5.6EC

NOTES
ALL RESISTORS ARE IN OHMS, ¼WATT UNLESS OTHERWISE NOTED.
ALL CAPACITORS ARE IN µF, 50WV UNLESS OTHERWISE NOTED.
ELECTROLYTIC CAPACITORS (=||=) ARE IN µF/WV.
VOLTAGE (MEASURED WITH V.T.V.M.)
[v] DC VOLTAGE IN (INPUT SIGNAL).
(v) DC VOLTAGE IN (STEREO).
PUT "K" MARK AT THE BACK OF SERIAL NUMBER AFTER A CHANGE

FM/AM PC BOARD(NAIMX-337)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
ICs		
Q101, 116	222407	TA-7060P 2.=
Q102	222421	HA-1137W 9.50
Q103	222413	HA-1156 7.70
Q106	222418	HA-1151 5.50
Q115	222402	TA-7061AP 3.—
Q117	222424	TA-7504S 5.—
Q126	222423	TA-7136P 2.50
Transistors		
Q104, 105	2210136	2SC1312(F)
Q108, 111, 114	2210046-1 or 2210045	2SC732(BL) 2SC732(GR)
Q109, 110, 118, 130, 121-125, 133-138	2210943	2SC1317(R)
	2210244 or	2SC735(Y)
Q112, 113, 128, 129	2210086	2SC733(BL)
Q119, 120	2210123	2SC380(O)
Q127	2210707	2SC1583(G)
Q131, 132	2210416	2SA726(F)
Diodes		
D101, 105, 110, 118, 124, 125, 128	223105	1S1555
D106-109, 112, 113, 115-117, 119, 120, 122, 126, 129, 130	2231031	1N60 Ⓝ FM
D111	223945	RD5.1EB
	224012 or	WZ-052
D122	223943	RD4.7EB
	224011 or	YZ-047
D127	223948	RD5.6EC
	223928 or	WZ-061
Varistor		
D102	4000022	VD1212
Coils		
L102, 110	233105	NCH1005
	233024 or	NCCH1501
L103	233074	NCCH1506
L104	233104	NMC-5001
	233032 or	NMC-8-7
L105	232042	NMC2504
L106	233031	NMC-9-1
L107	233024	NCCH1501
L109	233018	NMC-4-11
Transformers		
T101	233083	NIT-3516
	233101 or	NFIF-6003
T102	233084	NIT-0517
T103	232041	NIT-0509
T104	233078	NIT-0515P
T105	233079	NIT-0515S
Ceramic Filters		
X101	3010018	SFJ10.7MA(RED)
X103	3010006	SFE10.7MA(RED)
X104	3010012	CFT-455B
Crystal Oscillator		
X105	3010015	XTL-10.7M
Variable Resistors		
R138	5225018	R-HK1KB3P
R142	5225019	N10HR4.7KBD
R151	5225016	R-HK100KB3M
R257	5225055	N10HR2KBC

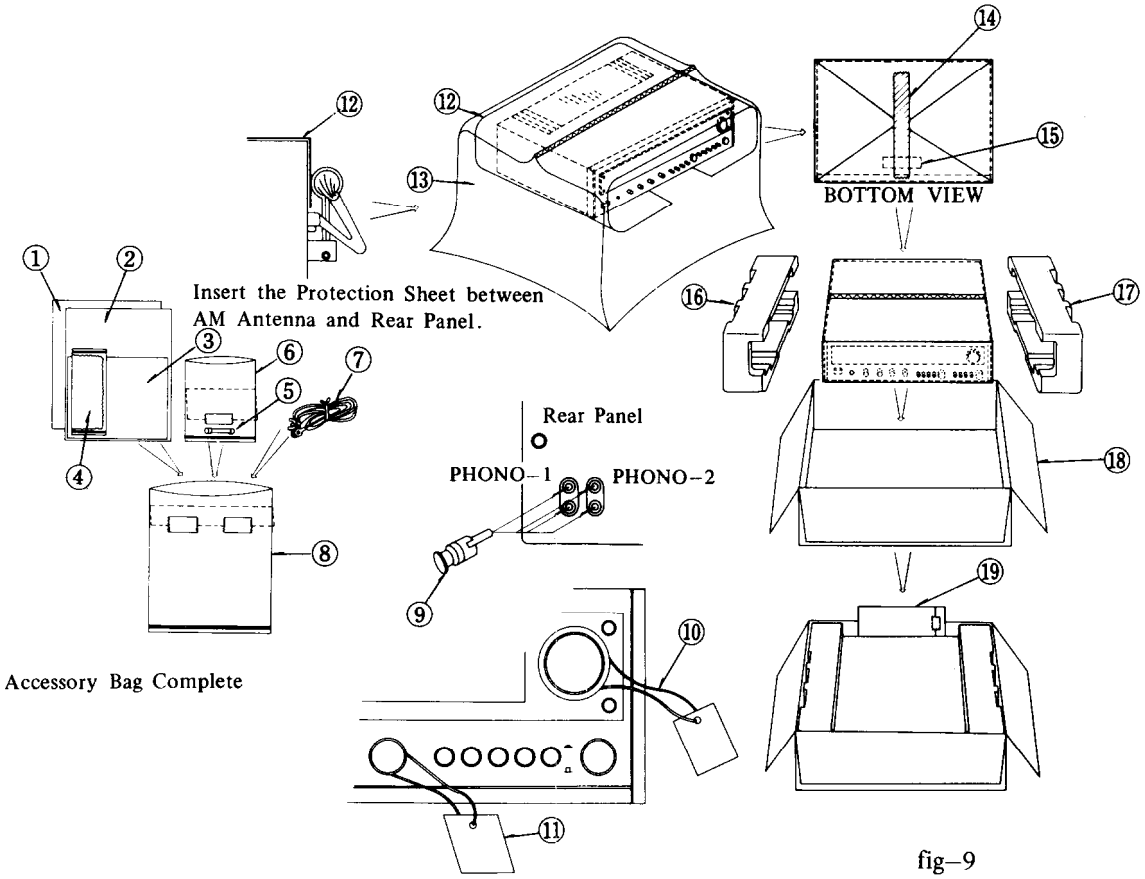
COMPONENT LOCATION



fig–8

ITEM	DESCRIPTION	TX–4500 STOCK NO.	Q'TY	TX–2500 STOCK NO.	Q'TY
1	Front Panel Ass'y	13829121	1	13809121	1
1-a	Front Panel	27210045	1	27210046	1
1-b	End Cap	28125032	2	28125032	2
1-c	Dial Glass	28191007	1	28191008	1
1-d	Spacer	27270014	4	27270014	4
1-e	Decorative Screw	27300038	4	27300038	4
1-f	Tuning Ring	27265003	1	27265003	1
1-g	Tapping Screw 3STS+6BQ	834130062	2	834130062	2
2	Tuning Knob	28320136	1	28320136	1
2-a	Enamel Screw		(1)		(1)
3	Tapping Screw	831130082	6	831130062	6
4	Volume Knob	28320132	2	28320132	2
5	Tone Knob	28320131	4	28320131	4
6	Power Knob	28320130	1	28320130	1
7	Push Button A	28320133	5	28320133	4
8	Push Button B	28320134	4	28320134	3
9	Bottom Board	27170013A	1	27170014A	1
10	Rubber Cushion	280889	4	280889	4
11	Tapping Screw 3STS+16BQ	831130162	4	831130162	4
12	Dial Plate	28130032A	1	28130034	1
13	Bracket–Dial Plate	27240006	1	27240007	1
14	Pointer Ass'y	13829133	1	13829133	1
15	Pointer Rail	27300035	1	27300036	1
16	Bracket–Front	27110023B	1	27110024B	1
17	Tapping Screw 3STS+10BQ	834180102	4	834130102	4
18	Bracket–Headphone	27140090A	1	27140090	1
19	Amp. Box	28110057A	1	28110058B	1
20	Washer 4-12BS-Ni	870040	4	870040	4
21	Screw 4MS+15BS-Ni	82374015	4	82374015	4

PACKING PROCEDURE



fig–9

ITEM	DESCRIPTION	TX–4500 STOCK NO.	Q'TY	TX–2500 STOCK NO.	Q'TY
1	Instruction Manual	29340125	1	29340127	1
2	Caution Card–W	29355036–1	1	29355036–1	1
3	Warranty Card	293036–1	1	293036–1	1
4	Silicon Cloth	292017–2	1	292017–2	1
5	Fuse 3A(ST–2)	NONE		252005	1
	3A(SS–2)	NONE		252006	1
	4A(ST–2)	252038	1	NONE	
6	Poly Bag 80X150	29100002	1	29100002	1
7	FM Antenna Ass'y	292064	1	292064	1
8	Poly Bag 350X250	29100006A	1	29100006A	1
9	Shorted Pin PO–107	250153	4	250153	2
10	Tag–Sensor	29355039	1	29355039	1
11	Tag–Cabinet Composition	29380004	1	29380004	1
12	Sheet 500X1200	290093	1	290093	1
13	Poly Bag 720X1020	29100020	1	29100020	1
14	Adhesive Tape W30	261504	40cm	261504	40cm
15	Caution Card	293041	1	293041	1
16	Pad–Side (Left)	29090116A	1	29090116A	1
17	Pad–Side (Right)	29090115A	1	29090115A	1
18	Master Carton Box	29050054	1	29050060	1
19	Accessory Bag Complete (1–2, 4–8)	13829119	1		1

ALIGNMENT PROCEDURE

INSTRUMENTS REQUIRED

1. DC Ammeter
2. DC Voltmeter
3. AM/FM Sweep Generator
4. AM/FM Signal Generator
5. Vacuume Tube Voltage Meter (VTVM) AC, DC
6. Oscilloscope
7. Monitorscope
8. Distortion Analyzer
9. Stereo Modulator
10. Frequency Counter
11. CR Oscillator

GENERAL ALIGNMENT CONDITIONS

1. Signal input should be kept as low as possible.
2. Standard modulation is 400Hz 30% (AM), 400Hz 100% (FM MONO), pilot 10% sub and main 90% (FM STEREO).
3. Standard knob position
   SPEAKERS..... A VOLUME.....Maximum
   BASS, TREBLE & BALANCE.....Center
   LOW & HIGH FILTER.....OFF
   MODE..... STEREO
   LOUDNESS..... OFF
   MUTING LOCK & DOLBY ADAPTOR..... OFF
   TAPE 1, 2, 3..... OFF (SOURCE)

CENTER VOLTAGE ADJUSTMENT

Connect a 8-ohm load resistor across the SPEAKER terminals.
Connect the DC Voltmeter between CT and E terminal.

TX–4500

Adjust the voltage to 0±20mV with R504. (Left channel)
Adjust the voltage to 0±20mV with R604. (Right channel)

TX–2500

Adjust the voltage to 0±40mV with R504. (Left channel)
Adjust the voltage to 0±40mV with R604. (Right channel)
NOTE: Adjust after switching on for 10 minutes.

IDLING CURRENT ADJUSTMENT

Connect the DC Voltmeter between ID and CT terminal.

TX–4500

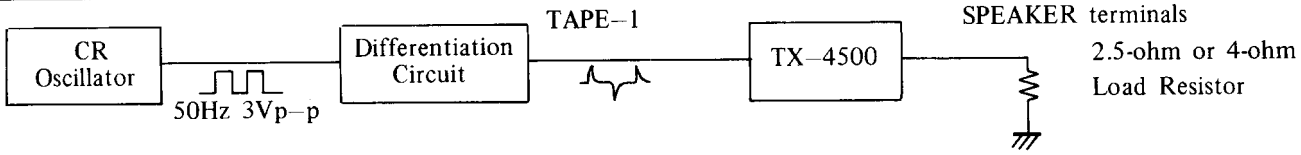
Adjust the voltage to 20±5mV with R518. (Left channel)
Adjust the voltage to 20±5mV with R618. (Right channel)

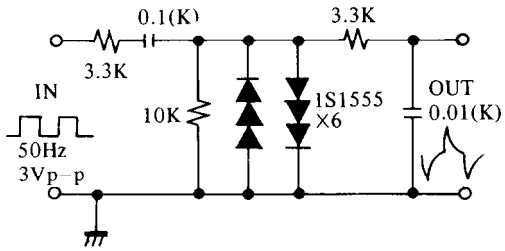
TX–2500

Adjust the voltage to 20±5mV with R514. (Left channel)
Adjust the voltage to 20±5mV with R614. (Right channel)

NOTE: Adjust after switching on for 10 minutes.
Open load VOLUME..... Minimum TAPE MONITOR–1..... ON

PROTECTIVE CIRCUIT ADJUSTMENT



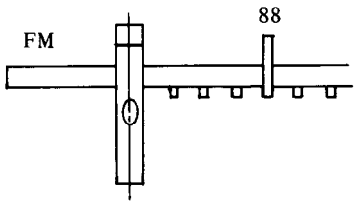


Load Resistor	CR Oscillator	Relay	Adjust
4-ohm, 100W	50Hz 3Vp–p	ON	R537 (Left channel) R637 (Right channel)
2.5-ohm, 100W		OFF	

NOTE: VOLUME.....Maximum
TAPE MONITOR–1.....ON

fig–10 Differentiation Circuit

ATTACHMENT OF DIAL POINTER

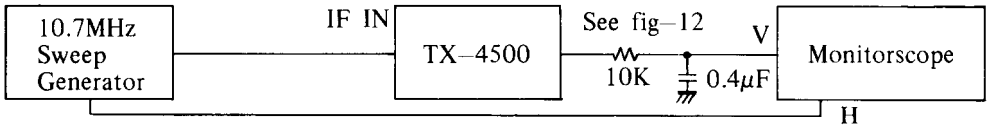


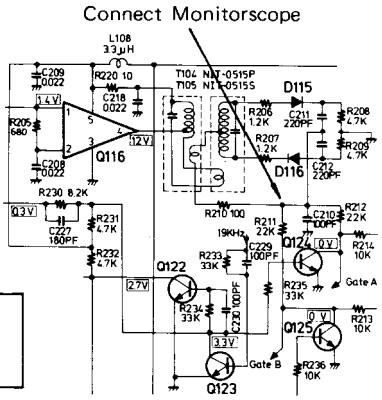
fig–11

1. Close the variable capacitor completely.
2. Set the radio dial pointer to zero (0) on dial scale and install the dial pointer ass'y.

QUARTZ LOCKED CIRCUIT ALIGNMENT

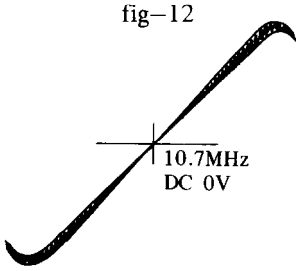
Set SELECTOR switch to FM.





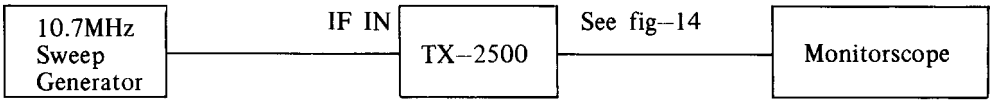
fig–12

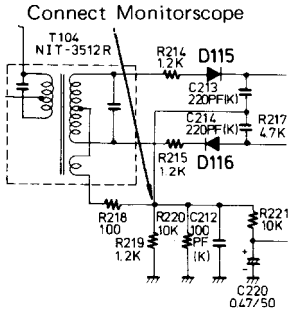
10.7MHz Sweep	Adjustment	Adjustment for
10.7MHz	T104, 105	Maximum symmetrical response fig–13



fig–13

SERVO LOCKED CIRCUIT ALIGNMENT

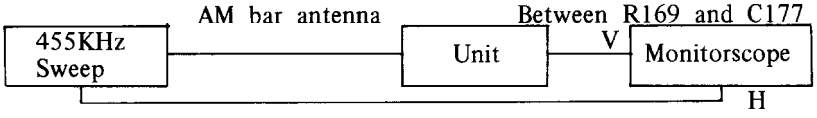


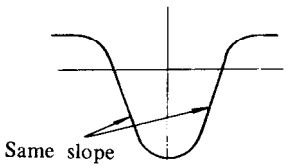


fig–14

10.7MHz Sweep	Adjust	Adjustment for
10.7MHz	T102, T104	Maximum symmetrical response fig–13

AM IF ALIGNMENT



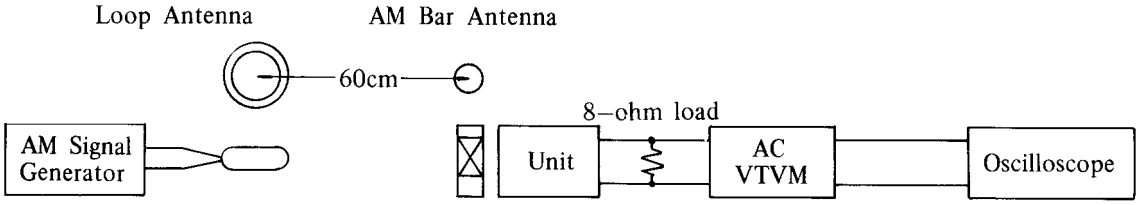


fig–15

Set Radio Dial	Adjust	Adjust for	Remarks
Upper end	X104 (TX–4500) X103 (TX–2500)	Maximum symetrical response	Usally not necessary to adjust

AM RF ALIGNMENT

Confirm start point of dial pointer before alignment.

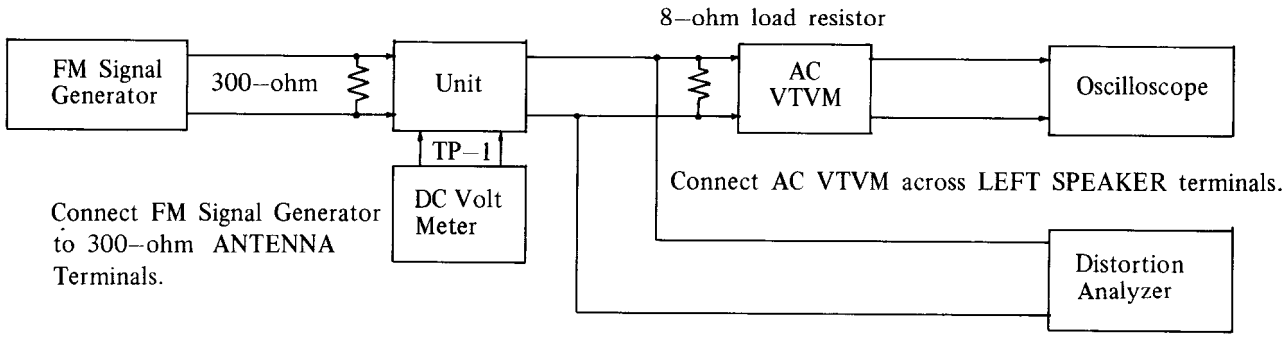


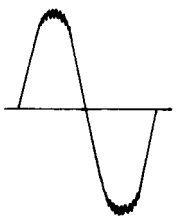
Connect AC VTVM across LEFT SPEAKER terminals.

Step	AM Signal Generator	Dial to set	Adjust		AC VTVM reading	Remarks
			TX–4500	TX–2500		
1	515KHz 400Hz 30% mod.	515KHz Lower end	L105 NMO–2504	L105 NMO–2503	Maximum	(Repeat step 1 and 2 as necessary)
2	1680KHz 400Hz 30% mod.	1680KHz Upper end	TC–5	TC–4	Maximum	
3	600KHz 400Hz 30% mod.	600KHz	L001 NMA–2521	L001 NMA–2520	Maximum	(Repeat step 3 and 4 as necessary)
4	1400KHz 400Hz 30% mod.	1400KHz	TC–2	TC–2	Maximum	

FM FRONT END ALIGNMENT

Set SELECTOR switch to FM.

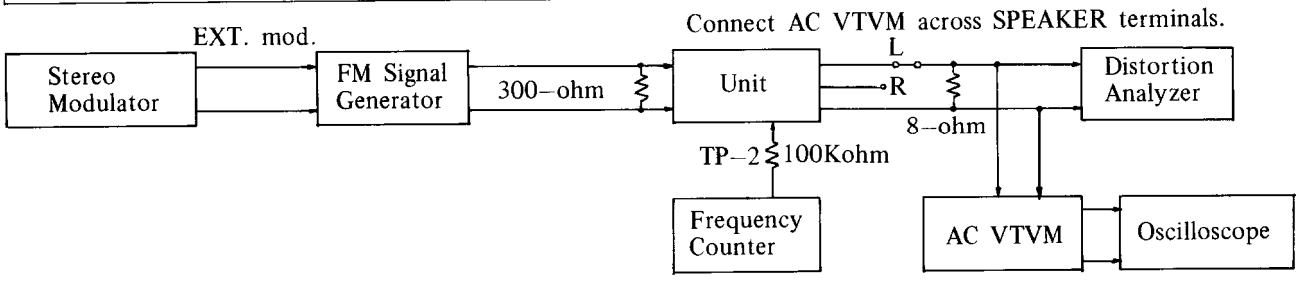




fig–16

Step	FM Signal Generator	Dial to set	Adjust		Output Indicator	Adjust for	Remarks
			TX-4500	TX-2500			
1	No Signal	Quiet Point	T101 Bottom	T101 Bottom	DC Volt Meter	0mV	
2	98MHz 400Hz 100% mod. 60dB	98MHz	T101 Top	T101 Top	Distortion Analyzer	Minimum Distortion	Set the output voltage to 3V with VOLUME.
3	Repeat step 1 and 2 as necessary.						
4	98MHz 400Hz 100% mod. 60dB	98MHz	R257		TUNING Meter	Center	
5	90MHz 400Hz 100% mod. 60dB	90MHz	OSC Coil L0	OSC Coil L5	DC Volt Meter	0mV	
6	106MHz 400Hz 100% mod. 60dB	106MHz	OSC Trimmer TC5(TC 0)	OSC Trimmer TC5	Same as above	0mV	
7	Repeat step 5 and 6 as necessary.						
8	90MHz 400Hz 100% mod.	90MHz	L1(LA) L2(LR1) L3(LR2)	L1 L2	AC VTVM or Oscilloscope	Maximum	Set FM Signal Generator level as low as possible. fig-16
9	106MHz 400Hz 100% mod.	106MHz	TC1(TCA) TC3(TCR1) TC4(TCR2)	TC1 TC3	Same as above	Maximum	
10	Repeat step 8 and 9 as necessary						
11	98 MHz 400Hz 100% mod.	98MHz	IF Core Top and Bottom L5	IF Core L4	AC VTVM or Oscilloscope	Maximum	

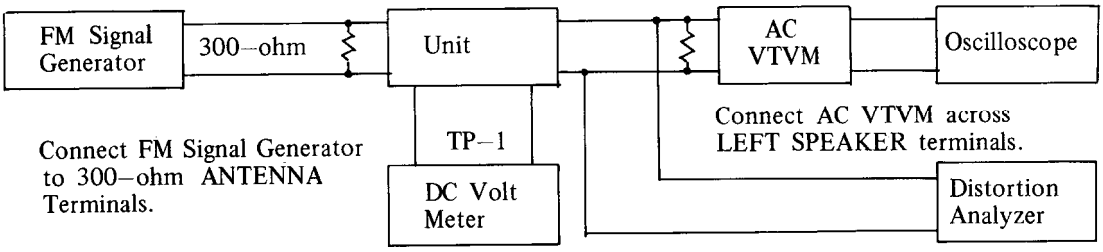
FM MONO DISTORTION AND MULTIPLEX ALIGNMENT

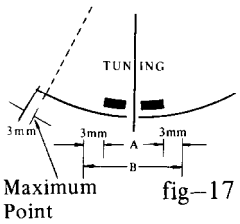


Alignment	Step	FM Signal Generator	Stereo Modulator	Dial to set	Adjust		Output Indicator	Adjust for	Remarks
					TX-4500	TX-2500			
Mono Distortion		98MHz 400Hz 100% mod. 60dB	———	98MHz	T101 Bottom	T101 Bottom	Distortion Analyzer	Minimum	
19KHz	1	98MHz 400Hz 100% mod. 60dB	———	98MHz	R142	R127	Frequency Counter	19000±19Hz	
	2	STEREO INDICATOR should light up when stereo program is being received.							
Multiplex	1	98MHz EXT. Mod.	Pilot Sig. 10% Main & Sub Sig. 1KHz Lch 90%	98MHz	R138	R157	AC VTVM Right ch.	Minimum	Repeat step 1 & 2 as necessary
	2	Same as above	Pilot Sig. 10% Main & Sub Sig. 1KHz Rch 90%	98MHz	R138	R157	AC VTVM Left ch.	Minimum	

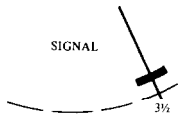
FM TUNING METER, STRENGTH METER AND MUTING ADJUSTMENT

Set SELECTOR switch to FM.





fig–17

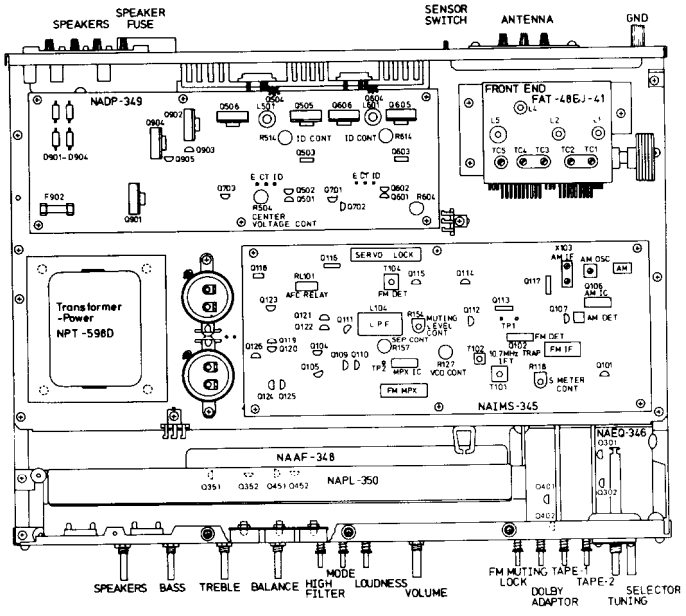


fig–18

Set TUNING dial pointer and FM Signal Generator Frequency (no mod.) to 98MHz.
Confirm LOCKED LAMP should light up.

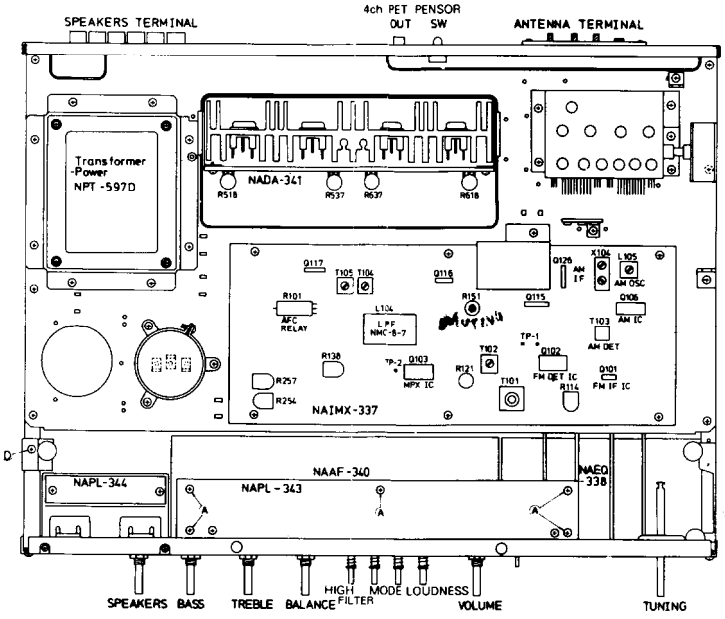
Adjustment		FM Signal Generator	Dial to set	Adjust	Output Indicator	Adjust for	Remarks
TUNING METER		98MHz 60dB no mod.		R254(width) R257(center)	TUNING METER	fig–17	TX–4500
STRENGTH METER		98MHz 400Hz 100% mod. 70dB	98MHz	R114 (TX–4500) R118 (TX–2500)	STRENGTH METER	fig–18	
MUTING	1	98MHz 400Hz 100% mod. 12dB	98MHz	R151 (TX–4500)	Oscilloscope or AC VTVM	signal	Repeat step 1 & 2.
	2	11dB		R154 (TX–2500)		no signal and noise	

CHASSIS LAYOUT

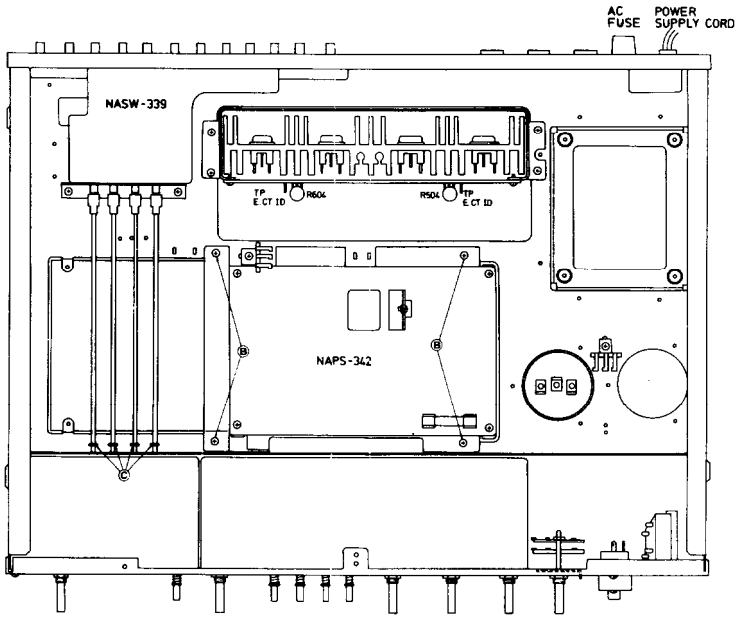


fig–19
TX–2500
TOP VIEW

CHASSIS LAYOUT



fig–20
TX–4500
TOP VIEW



fig–21
TX–4500
BOTTOM
VIEW

- **Replacing of the pilot lamp** requires release of 5 tapping screws on (A).
- Checking of **the PC board of NAIMX–337** calls for removal of 4 tapping screws of (B).
- When **replacing the push SW**(TAPE MONI (AUX) 1 – 3, DOLBY), arrange for release of (C) E ring first.
- Adjustment **in tension of the dial cord** requires easing of tapping screw (D) to allow for sliding in position of metal fittings.

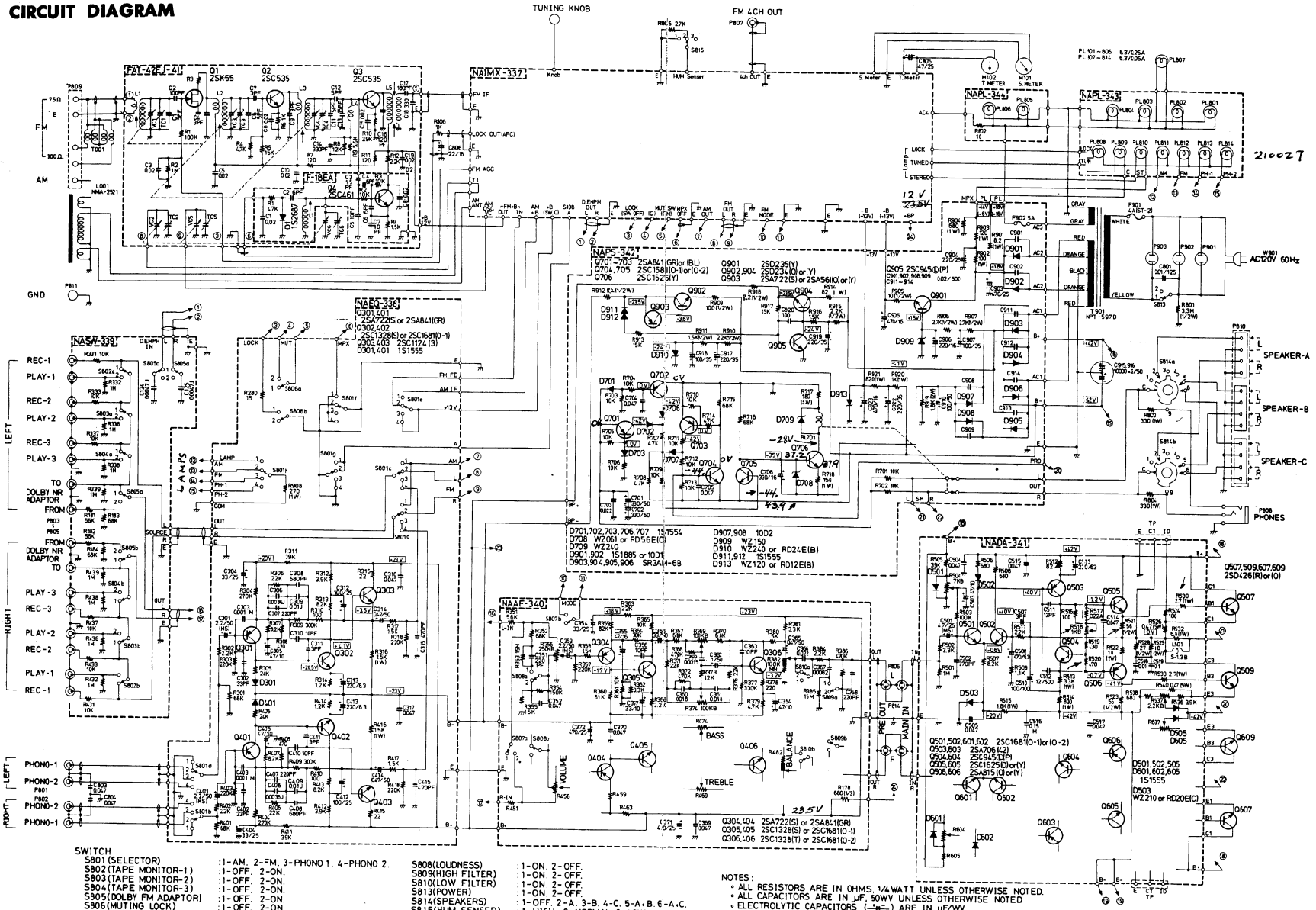
TX-4500 PARTS LIST

PARTS NO.	DESCRIPTION	SPECIFICATIONS	Q'TY	STOCK NO.	REMARKS
U1	Front End	FAT-42EJ-41	1	240035	
U2	Printed Circuit Board Ass'y	NAIMX-337	1	13829537	Tuner Section
U3	Printed Circuit Board Ass'y	NAEQ-338	1	13829538	Equalizer Section
U4	Printed Circuit Board Ass'y	NASW-339	1	13829539	Switch Section
U5	Printed Circuit Board Ass'y	NAAF-340	1	13829540	Tone Section
U6	Printed Circuit Board Ass'y	NADA-341	1	13829541	Driver Section
U7	Printed Circuit Board Ass'y	NAPS-342	1	13829542	Power Supply Section
U8	Printed Circuit Board Ass'y	NAPL-343	1	13829543	Pilot Lamp Section
U9	Printed Circuit Board Ass'y	NAPL-344	1	13829544	Pilot Lamp Section
Q607, Q608 Q661, Q662	Transistor	2SD426(R) or (O)	4	2200393 or 2200394	Using same hfe rank
PL807	Lamp-Pilot	6.3V0.05AW-3	1	210015	Pointer
T901	Transformer-Power	NPT-597D	1	230154	
T001	Transformer-BLN	NBLN-1	1	233026	
L001	Coil-Antenna	NMA-2521	1	232055	
C801	Capacitor-UL	UL125V103M	1	3504012	
C805	Capacitor-Elect.	CE04W25V47μF	1	352754701	
C806	Capacitor-Elect.	CE04W16V22μF	1	352742201	
C915	Capacitor-Elect.	CE62B50V10000X2S-L	1	3004075 or 3004083	
R803, R804	Resistor-Metal Oxide Film	RS1WBJ330ohm	2	441623314	
S813	Switch-Push	NPS1111LN4	1	25035027	Power Source
S814	Switch-Rotary	NRS-226-30Y	1	25030058	Speakers
S815	Switch-Slide	NSS-2327	1	25065016	Sensor
P801, P802	Pin Jack	NTM-2WPBL-E1	2	250170	PHONO
P806	Pin Jack	NTM-4WPBL-E1	1	250169	PRE, MAIN
P807	Pin Jack	NTM-1WPBL-E1	1	250256	4 Channel Out
P808	Jack-Stereo Head Phone	LJ-100-H	1	25045018	
P809	Terminal	NTM-3PUM1	1	25060021A	Antenna
P810	Terminal	NTM-12PUR1	1	25060005	Speakers
P811	Terminal		1	270665	
P814	Shorted Plug		2	25055015	
P901-P903	Socket-AC	S-16432	3	25050008	
W901	Power Supply Cord	AS-UC	1	253072	
F901	Fuse	4A (ST-2)	1	252038	
F901a	Fuse Holder	S-N1301	1	250080	
M101	Tuning Indicator	NIND-0500S53	1	243054	Strength
M102	Tuning Indicator	NIND-0250S54	1	243055	Tuning
Q997a, Q998a Q997, Q998	Socket-Transistor	M-1614	4	250249	Power Transistor
	Binder	SKB-1	20	260208	
A903	Shorted Pin	PO-107	4	250153	
A001	Chassis		1	27100013B	
A006	Drum		1	27200020	
A007	Spring	SP-14A	2	273803	Drum
A008	Dial String			273903	
A009	Heat Sink		1	27160015	
A013	Shaft		4	27260005	Push Switch
A015	Joint		4	28320135	Push Switch
A017	Shielded Plate		1	27150045	
A034	Dial Pulley	DP-16N	4	271850002	
A041	Drive Shaft Ass'y		1	272050C5	
A042	Shielded Plate		1	281750C04	
A045	Pointer		1	28165031	
A047	Pointer Slider		1	27220008	
A049	Dial Plate		1	28130032A	
A069	Back Panel		1	27120038	
A071	Holder-Antenna		1	27190015A	
A072	Strain Relief	SR-3P-4	1	270025	
A073	Strain Relief	SR-4K-4	1	270280	
A301	Amp Box		1	28110057A	
A305	Front Panel Ass'y		1	13829121	
A501	Front Panel		(1)	27210045	
A502	End Cap		(2)	28125032	
A503	Clear Plate		(1)	28191007	
A504	Spacer		(4)	27270014	
A505	Decorative Screw		(4)	27300038	
A509	Tuning Ring		(1)	27265003	
A802	Knob-Tuning		1	28320136	
A803	Knob-Volume		2	28320132	
A804	Knob-Tone		4	28320131	
A805	Button-Power		1	28320130	

PARTS NO.	DESCRIPTION	SPECIFICATIONS	Q'TY	STOCK NO.	REMARKS
A806	Button-Push		5	28320133	
A808	Button-Push		4	28320134	
A632	Bottom-Board		1	27170013A	
A633	Bottom-Cushion		4	280889	
A851	Master Carton Box		1	29050054	
A852	Pad-Right		1	29090115A	
A853	Pad-Left		1	29090116A	
A854	Poly Bag	720X1020	1	29100020	
A864	Poly Bag		1	29100006A	
A856	Poly Bag	80X150	1	29100002	
A857	Sheet	500X1200	1	290093	
A880	Instruction Manual		1	29340125	
A881	Warranty Card		1	293036-1	
A882	Caution Card		1	293041	
A883	Caution Label A		1	282969	
A884	Caution Card		1	29355036-1	
A885	Tag-Cabinet Composition		1	29380004	
A887	Tag-Sensor		1	29355039	
A901	Silicon Cloth		1	292017-2	
A902	FM Antenna	5059-01	1	292064	
A904	Fuse	4A(ST-2)	1	252038	
((NAEQ-338))					
Q301, Q401	Transistor	2SA722(S) or 2SA841(GR)	2	2210913 or 2210665	
Q302, Q402	Transistor	2SC1328(S) or 2SC1681(O-1)	2	2210925 or 2210670	
Q303, Q403	Transistor	2SC1124(I)	2	2200101	
D301, D401	Diode-Silicon	1S1555	2	223105	
C304, C404	Capacitor-Elect.	CE04W25V33μF	2	352753301	
C305, C405	Capacitor-Elect.	CE04W10V47μF	2	352734701	
C312, C412	Capacitor-Elect.	CE04W25V100μF	2	352751011	
C313, C413	Capacitor-Elect.	CE04W6.3V220μF	2	352722211	
C314, C414	Capacitor-Elect.	CE04W50V0.47μF	2	352784791	
C301, C401	Capacitor-LR or Capacitor-MS	LR0H50V2.2μF, MS04C50V2.2μF	2	3926800221 or 3926805221	
R316, R416	Resistor-Metal Oxide Film	RS1WBJ1K	2	4411621525	
R908	Resistor-Metal Oxide Film	RS1WBJ22	1	441622714	
S801a-h	Switch-Rotary	NRS-1348-0K	1	25030661	Selector
S806a, b	Switch-Push	NPS-1224-7	1	25035029	Muting
((NASW-339))					
S802	Push Switch	NPS-1228-142LA	1	25035030	
P803	Pin Jack	NTM-4PB1-E1	1	25045014	
P804, P805	Pin Jack	NTM-6PB1-E1	2	25045019	
((NAAF-340))					
Q304, Q404	Transistor	2SA722(S) or 2SA841(GR)	2	2210915 or 2210665	
Q305, Q405	Transistor	2SC1328(S) or 2SC1681(O-1)	2	2210925 or 2210670	
Q306, Q406	Transistor	2SC1328(S) or 2SC1681(O-2)	2	2210925 or 2210671	
C354, C454	Capacitor-Elect.	CE04W25V33μF	1	352753301	
C355, C455	Capacitor-Elect.	CE04W16V47μF	1	352744701	
C357, C457	Capacitor-Elect.	CE04W10V33μF	1	352733301	
C358, C458	Capacitor-Elect.	CE04W50V3.3μF	1	352780331	
C362, C462	Capacitor-Elect.	CE04W50V10μF	1	352780101	
C364, C464	Capacitor-Elect.	CE04W10V47μF	1	352734701	
C365, C465	Capacitor-Elect.	CE04W50V0.47μF	1	352784791	
C221, C272 C411, C472	Capacitor-Elect.	CE04W25V470μF	2	352754711	
C352, C452	Capacitor-DE	DE93M50V473μF	2	374124735	
C353, C453	Capacitor-LR or Capacitor-MS	LR0H50V2.2μF, MS04C50V2.2μF	2	3926800221 or 3926805221	
R356, R456	Resistor-Variable	N24RGP20KBT30-41C	2	5172042	VOLUME
R366, R374 R469, R474	Resistor-Variable	N24RGP10KB30-21C	4	5172044	TONE
R382, R482	Resistor-Variable	N24RGP10KMN30-C	2	5172043	BALANCE
S807-S810	Switch-Push	NPS-1224LA	1	25035033	Loudness Mode Filter
((NADA-341))					
Q501, Q502 Q601, Q602	Transistor	2SC1681(O-1) or (O-2)	4	2210670 or 2210671	
Q503, Q603	Transistor	2SA706(4)	2	2200033	
Q504, Q604	Transistor	2SC945(L,P)	2	2210743	
Q505, Q605	Transistor	2SC1625(-) or (Y)	2	2200393 or 2200394	
Q506, Q606	Transistor	2SA815(C or (Y)	2	2200403 or 2200404	
D501, D502, D503 D601, D602, D603	Diode-Silicon	1S1555	6	223105	
D503	Diode-Zener	WZ-210 (RD-20E(C)	1	223921 or 223976	
C503, C603	Capacitor-Elect.	CE04W10V47μF	2	352734701	
C508, C608	Capacitor-Elect.	CE04W6.3V47μF	2	352724711	
C510, C610	Capacitor-Elect.	CE04W10V100μF	2	352791011	

PARTS NO.	DESCRIPTION	SPECIFICATIONS	Q'TY	STOCK NO.	REMARKS
C513, C613	Capacitor-Elect.	CE04W6.3V220μF	2	352722113	
C516, C616	Capacitor-DE	DE93M50V154M	2	374121547	
C519, C619	Capacitor-DE	DE93M50V104K	2	374121045	
C501, C601	Capacitor-MS or Capacitor-LR	MS04C25V4.7μF LR0H25V4.7μF	2	3926804771 3926504771	
R504, R604	Resistor-Semi Fixed	R-HK4.7KB3S	2	5221008	
R518, R618	Resistor-Semi Fixed	R-HK1KB3S	2	5221017	
R537, R637	Resistor-Semi Fixed	R-HK2.2KB3S	2	5221007	
R513	Resistor-Metal Oxide Film	RS1WBJ3.3K	2	441623324	
R514	Resistor-Metal Oxide Film	RS1WBJ820	2	441628214	
R515	Resistor-Metal Oxide Film	RS1WBJ1.8K	2	441621824	
R517	Termistor	D22A	2	4000003	
R522	Resistor-Metal Film	RNU1WCJ10	2	451631004	
R529	Resistor-Metal Film	RNU2WCJ10	2	451731004	
R530, R533 R630, R633	Resistor-Metal Film	RNU1WCJ2.7	4	451630274	
R532	Resistor-Metal Film	RNU1WCJ6.8	2	451630684	
R526, R540 R626, R640	Resistor-Cement	RSS5WK0.47	4	48114795	
	Radiator	RAD-01	6	270187-1	
L501, L601	Coil-S	S-1.3B	2	231001	
((NAPS-342))					
Q701, Q702 Q703	Transistor	2SA841(GR) or (BL)	3	2210665 or 2210666	
Q704, Q705	Transistor	2SC1681(O-1) or (O-2)	2	2210670 or 2210671	
Q706	Transistor	2SC1625(Y)	1	2200394	
Q901	Transistor	2SD235(Y)	1	2200014	
Q902, Q904	Transistor	2SD234(O) or (Y)	2	2210913 or 2200020	
Q903	Transistor	2SA561(O), (Y) or 2SA723(S)	1	2210073, 2210074, 2210915	
Q905	Transistor	2SC945(L)(P)	1	2210743	
D701-D703 D705, D707	Diode-Silicon	1S1554	5	223106	
D708	Diode-Zener	WZ-061 or RD5.6E(C)	1	223928 or 223948	
D709	Diode-Zener	WZ-240	1	223916	
D901, D902	Diode-Silicon	1S1885 or 10D1	2	223802 or 223801	
D903, D906 D905, D904	Diode-Silicon	SR3AM-6B	4	223815	
D907, D908	Diode-Silicon	10D2	2	223805	
D909	Diode-Zener	WZ-130	1	223924	
D910	Diode-Zener	WZ-240 or RD24E(B)	1	223916 or 223971	
D911, D912	Diode-Silicon	1S1555	2	223105	
D913	Diode-Zener	WZ-120 or RD12E(B)	1	223910 or 223965	
C701, C702	Capacitor-Elect.	CE04W50V330μF	2	352783311	
C706	Capacitor-Elect.	CE04W16V330μF	1	352743311	
C903	Capacitor-Elect.	CE04W25V470μF	1	352754711	
C904	Capacitor-Elect.	CE04W25V220μF	1	352752211	
C905, C923	Capacitor-Elect.	CE04W16V470μF	2	352744711	
C906	Capacitor-Elect.	CE04W16V220μF	1	352742211	
C907, C918	Capacitor-Elect.	CE04W35V100μF	2	352761011	
C910	Capacitor-Elect.	CE04W50V100μF	1	352781011	
C912, C922 C919	Capacitor-Elect.	CE04W35V220μF	3	352762211	
R717	Resistor-Metal Oxide Film	RS1WBJ180	1	441621814	
R718	Resistor-Metal Oxide Film	RS1WBJ150	1	441621514	
R902	Resistor-Metal Oxide Film	RS1WBJ100	1	441621014	
R903	Resistor-Metal Oxide Film	RS1WBJ120	1	441621214	
R904	Resistor-Metal Oxide Film	RS1WBJ680	1	441626814	
R901	Resistor-Metal Film	RNU1WCJ8.2	1	451630824	
R919	Resistor-Metal Oxide Film	RS2WBJ1.8K	1	441721824	
R920	Resistor-Metal Oxide Film	RS1WBJ1K	1	441621024	
R921	Resistor-Metal Oxide Film	RS1WBJ820	1	441628214	
F902	Fuse	5A-T	1	252020	
F902a	Fuse Holder	SN5051	2	250113	
RL701	Relay	NRL2P5ADC24	1	25065015	11.50
	Radiator	RAD-01	4	270187-1	
((NAPL-343))					
PL801-PL804	Pilot Lamp	6.3V0.25A	4	210026	Fuse type
PL808-PL814	Pilot Lamp	6.3V0.05A	7	210027	
	Fuse Holder	SN5051	8	250113	
((NAPL-344))					
PL805, PL806	Pilot Lamp	6.3V0.25A	2	210026	
	Fuse Holder	SN5051	4	250113	

TX-4500 CIRCUIT DIAGRAM

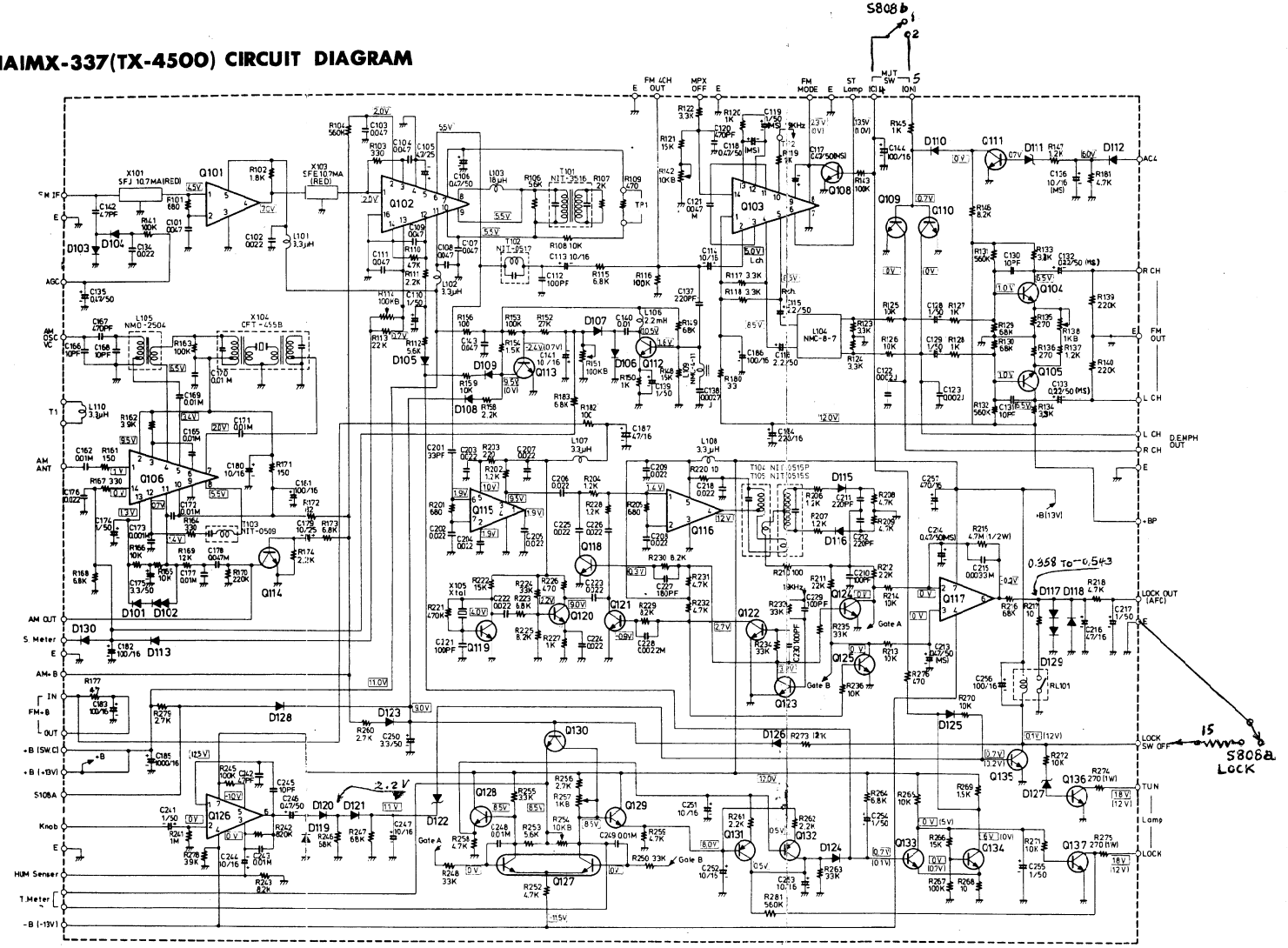


SWITCH

S801(SELECTOR)	:1-AM. 2-FM. 3-PHONO 1. 4-PHONO 2.	S808(LOUDNESS)	:1-ON. 2-OFF.
S802(TAPE MONITOR-1)	:1-OFF. 2-ON.	S809(HIGH FILTER)	:1-ON. 2-OFF.
S803(TAPE MONITOR-2)	:1-OFF. 2-ON.	S810(LOW FILTER)	:1-ON. 2-OFF.
S804(TAPE MONITOR-3)	:1-OFF. 2-ON.	S813(POWER)	:1-OFF. 2-A. 3-B. 4-C. 5-A+B. 6-A+C.
S805(DOLBY FM ADAPTOR)	:1-OFF. 2-ON.	S814(SPEAKERS)	
S806(MUTING LOCK)	:1-OFF. 2-ON.	S815(HUM SENSER)	:1-HIGH. 2-NORMAL. 3-LOW.
S807(MODE)	:1-STEREO. 2-MONO.		

NOTES:
- ALL RESISTORS ARE IN OHMS, 1/4 WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF, 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (—⊕—) ARE IN μF/WV.
- VOLTAGE (MEASURED WITH V.T.V.M) (NO INPUT SIGNAL).

NAIMX-337(TX-4500) CIRCUIT DIAGRAM

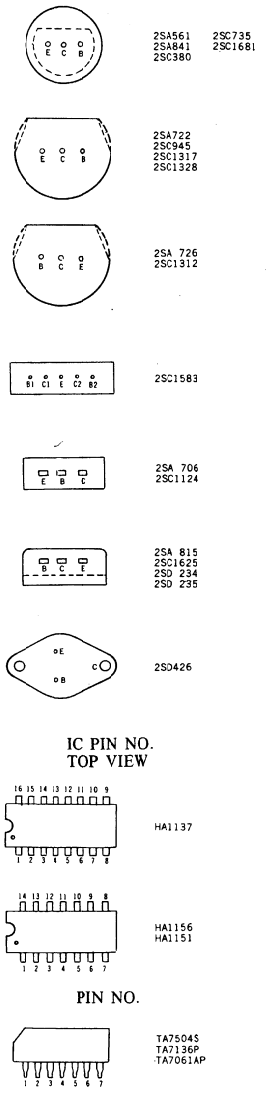


Q101,Q116 ---------- TA7060P
Q102 ---------- HA1137
Q103 ---------- HA1156W
Q104,Q105 ---------- 2SC1312(F)
Q106 ---------- HA1151
Q108,Q111,Q114 ---------- 2SC945(L)Q
Q109,Q110,Q118,Q130 ---- 2SC1317(R) or 2SC735(Y)
Q121-Q125,Q133-Q137 ----
Q112,Q113,Q128,Q129 ---- 2SC733(BL)
Q115 ---------- TA7061AP
Q117 ---------- TA7504S
Q119,Q120 ---------- 2SC380(O)
Q126 ---------- TA7136P
Q127 ---------- 2SC1583G
Q131,Q132 ---------- 2SA726(F)

D101,D105,D110,D118 ---- 1S1555
D121,D124,D125,D128 ----
D102 ---------- VD1212
D103,D104,D106-D109 ----
D112-D117,D119,D120 ---- 1N60
D123,D126,D129 D130 ----
D111 ---------- WZ051 or RD5.1EB
D122 ---------- YZ047 or RD4.7EB
D127 ---------- WZ061 or RD5.6EC

NOTES
ALL RESISTORS ARE IN OHMS, ¼WATT UNLESS OTHERWISE NOTED.
ALL CAPACITORS ARE IN μF, 50WV UNLESS OTHERWISE NOTED.
ELECTROLYTIC CAPACITORS (⊣⊢) ARE IN μF/WV.
VOLTAGE (MEASURED WITH V.T.V.M.)
[v] DC VOLTAGE (NO INPUT SIGNAL).
(v) DC VOLTAGE (FM STEREO)

Semiconductors
Bottom View

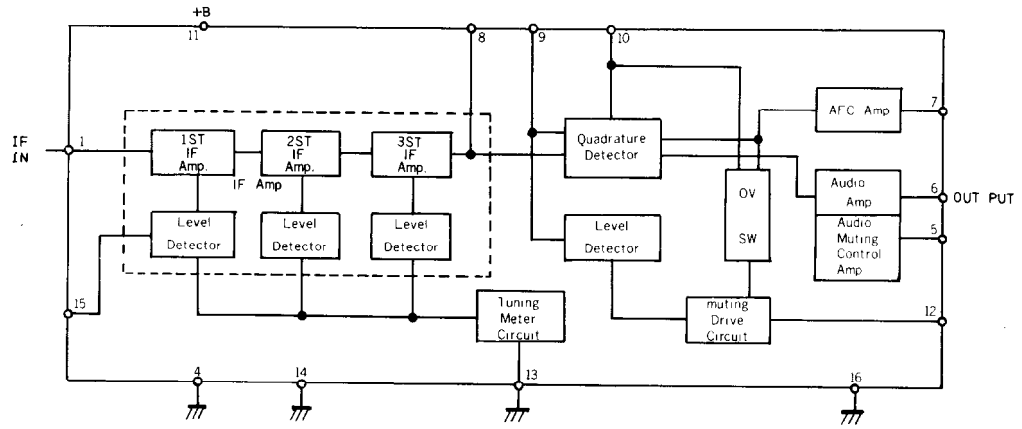


IC PIN NO.
TOP VIEW

NAIMX-337 PARTS LIST

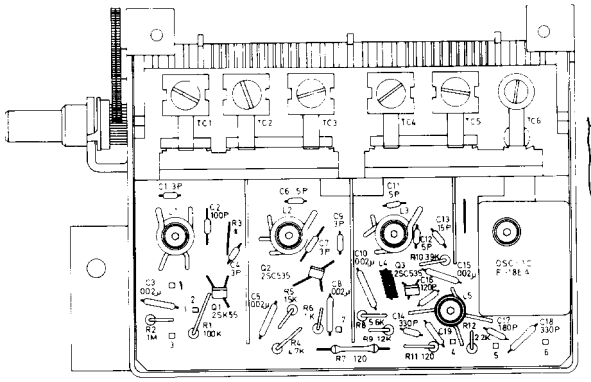
PARTS NO.	DESCRIPTION	SPECIFICATIONS	Q'TY	STOCK NO.	REMARKS
Q101, Q116	IC	TA-7060P	2	222407	FM IF Amp
Q102	IC	HA-1137W	1	222421	FM DET
Q103	IC	HA-1156	1	222419	FM MPX
Q106	IC	HA-1151	1	222418	AM
Q115	IC	TA-7061AP	1	222402	FM IF Amp
Q117	IC	TA-7504S	1	222424	OP Amp
Q126	IC	TA-7136P	1	222423	Sensor Amp
Q104, Q105	Transistor	2SC1312(F)	2	2210136	
Q108, Q111, Q114	Transistor	2SC945 Ⓛ Q1	3	2210745	
Q109, Q110, Q118, Q121, Q125 Q130, Q133, Q137	Transistor	2SC735(Y) or 2SC1317(R)	14	2210244 or 2210943	
Q112, Q113, Q128, Q129	Transistor	2SC733(BL)	4	2210086	
Q119, Q120	Transistor	2SC380(O)	2	2210123	
Q127	Transistor	2SC1583(G)	1	2210707	
Q131, Q132	Transistor	2SA726(F)	2	2210416	
D101, D105, D110, D118, D121 D124, D125, D126	Diode-Silicon	1S1555	8	223105	
D102	Varistor	VD1212	1	4000022	
D103, D104, D106, D109, D112, D117 D119, D120, D123, D126, D129	Diode-Germanium	1N60 Ⓝ FM	16	2231031	
D111	Diode-Silicon	RD5.1EB or WZ-052	1	223945 or 224012	
D122	Diode-Silicon	RD4.7EB or YZ047	1	223943 or 224011	
D127	Diode-Silicon	RD5.6EC or WZ-061	1	223948 or 223928	
L101, L102, L107, L108, L110	Choke Coil	NCCH-1501	5	233204	3.3μH
L103	Choke Coil	NCCH-1506	1	233074	
L104	Coil-MPX	NMC-8-7	1	233032	Low Pass Filter
L105	Coil-OSC	NMO-2504	1	232042	AM OSC
L106	Coil-MPX	NMC-9-1	1	233031	2.2μH
L109	Coil-MPX	NMC-4-11	1	233018	
T101	Transformer-IF	NIT-3516	1	233083	Quadrature Detector
T102	Transformer-IF	NIT-0517	1	233084	10.7MHz Trap
T103	Transformer-IF	NIT-0509	1	232041	AM DET
T104	Transformer-IF	NIT-0515P	1	233078	FM DET
T105	Transformer-IF	NIT-0515S	1	233079	FM DET
X101	Ceramic Filter	SFJ10.7MA	1	3010018	(RED)
X103	Ceramic Filter	SFE10.7MA	1	3010006	(RED)
X104	Ceramic Filter	CFT-455B	1	3010012	
X105	Crystal Oscillator	XTL-10.7M	1	3010015	
C105	Capacitor-Elect.	CE04W25V4.7S	1	352750471	
C106, C132, C133, C135, C246	Capacitor-Elect.	CE04W50V0.47S	5	352784791	
C124, C217, C241, C110, C128 C129, C139, C254, C255	Capacitor-Elect.	CE04W50V1S	9	352780101	
C113, C114, C141, C180, C244 C247, C253	Capacitor-Elect.	CE04W16V10S	7	352741001	
C115, C116	Capacitor-Elect.	CE04W50V2.2S	2	352780221	
C175, C250	Capacitor-Elect.	CE04W50V3.3S	2	352780331	
C179, C251, C252	Capacitor-Elect.	CE04W25V10S	3	352751001	
C181, C182, C183, C186, C256	Capacitor-Elect.	CE04W16V100S	5	352741011	
C184	Capacitor-Elect.	CE04W16V220S	1	352742211	
C185	Capacitor-Elect.	CE04W16V1000S	1	352741021	
C187, C216	Capacitor-Elect.	CE04W16V47S	2	352744701	
C257	Capacitor-Elect.	CE04W16V470S	1	352744711	
C117, C118	Capacitor-MS	MS04C50V0.47M	2	392084797	
C119	Capacitor-MS	MS04C50V1M	1	392080107	
C136	Capacitor-MS	MS04C16V10M	1	3920410007	
C121, C178	Capacitor-DE	DE93M50V473M	2	374124737	
C213, C214	Capacitor-MS or Capacitor-LR	MS04C50V0.47M or LR04B50V0.47S	2	392084797 or 392684791	
R114	Resistor-Semi Fixed	R-HK100KB3P	1	5225013	
R138, R257	Resistor-Semi Fixed	R-HK1KB3P	2	5225018	
R142	Resistor-Semi Fixed	R-HK4.7KBD	1	5225019	
R151	Resistor-Semi Fixed	R-HK100KB3M	1	5225016	
R254	Resistor-Semi Fixed	R-HK10KB3P	1	5225017	
R274, R275	Resistor-Metal Oxide Film	RS1WBJ270	2	441622714	
RL101	Relay	L-13	1	25065026	AFC

HA-1137W BLOCK DIAGRAM

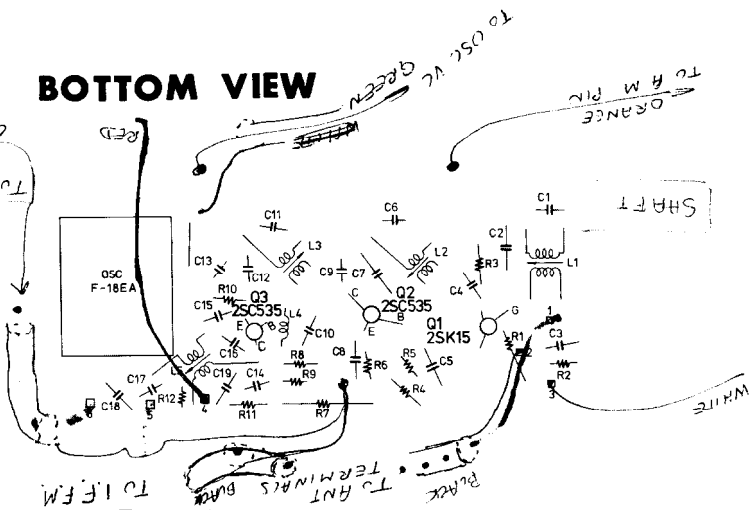


FM FRONT END BOARD VIEW
FAT-42EJ-41(TX-4500)

TOP VIEW



BOTTOM VIEW

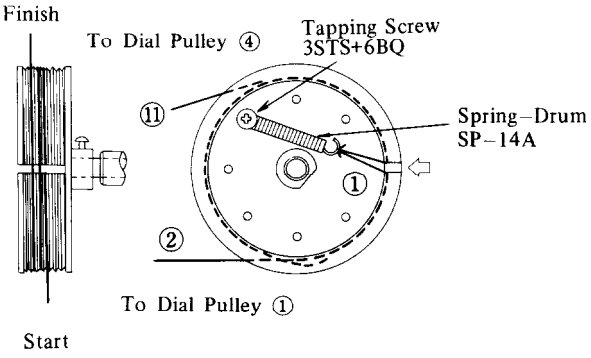


Terminals

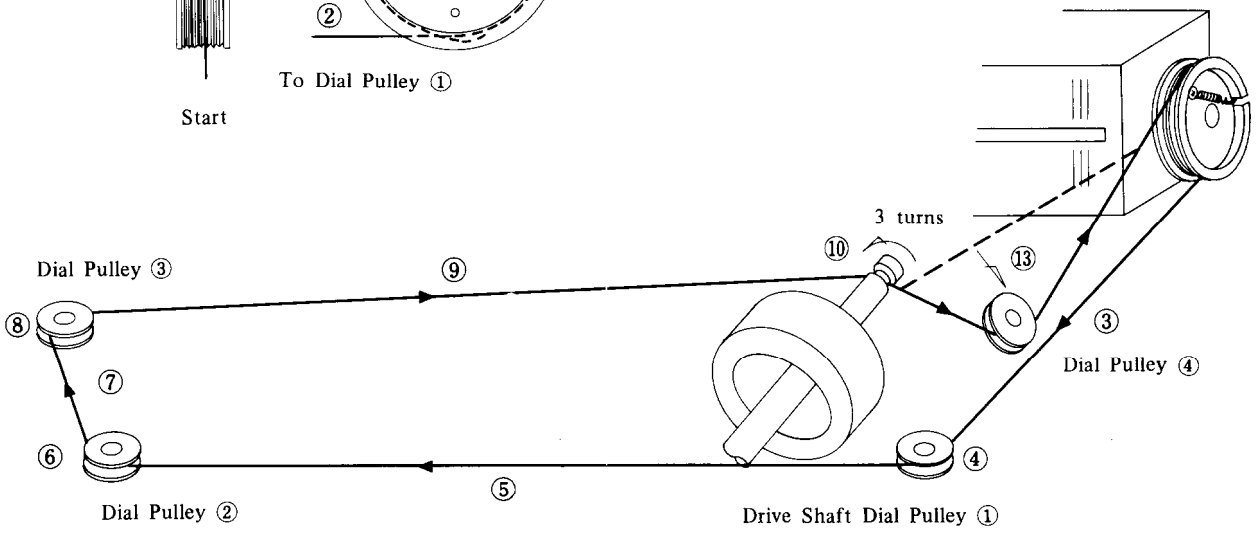
1. ANT (75–ohm)
2. ANT (E)
3. AGC
4. +B (12V)
5. IF OUT
6. AFC
7. E
8. AM. RF
9. AM. OSC

PARTS NO.	DESCRIPTION	SPECIFICATIONS	Q'TY	STOCK NO.	REMARKS
Q1	Transistor (FET)	2SK55(D)	1	2210954	RF Amp.
Q2	Transistor	2SC535(B)	1	2210882	RF Amp.
Q3	Transistor	2SC535(B)	1	2210882	Mixer
	OSC Block	F–18EA	1	222009	

DIAL CORD ARRANGEMENT



1. Close the variable capacitor complete and tie dial cord to the spring of the drum.
2. Thread dial cord in the direction of arrow from ① to ⑨ and wind dial cord three turns around the tuning shaft clockwise.
3. Thread dial cord in the direction of arrow from ⑩ to ⑫.
4. Thread dial cord to the dial pulley ④.

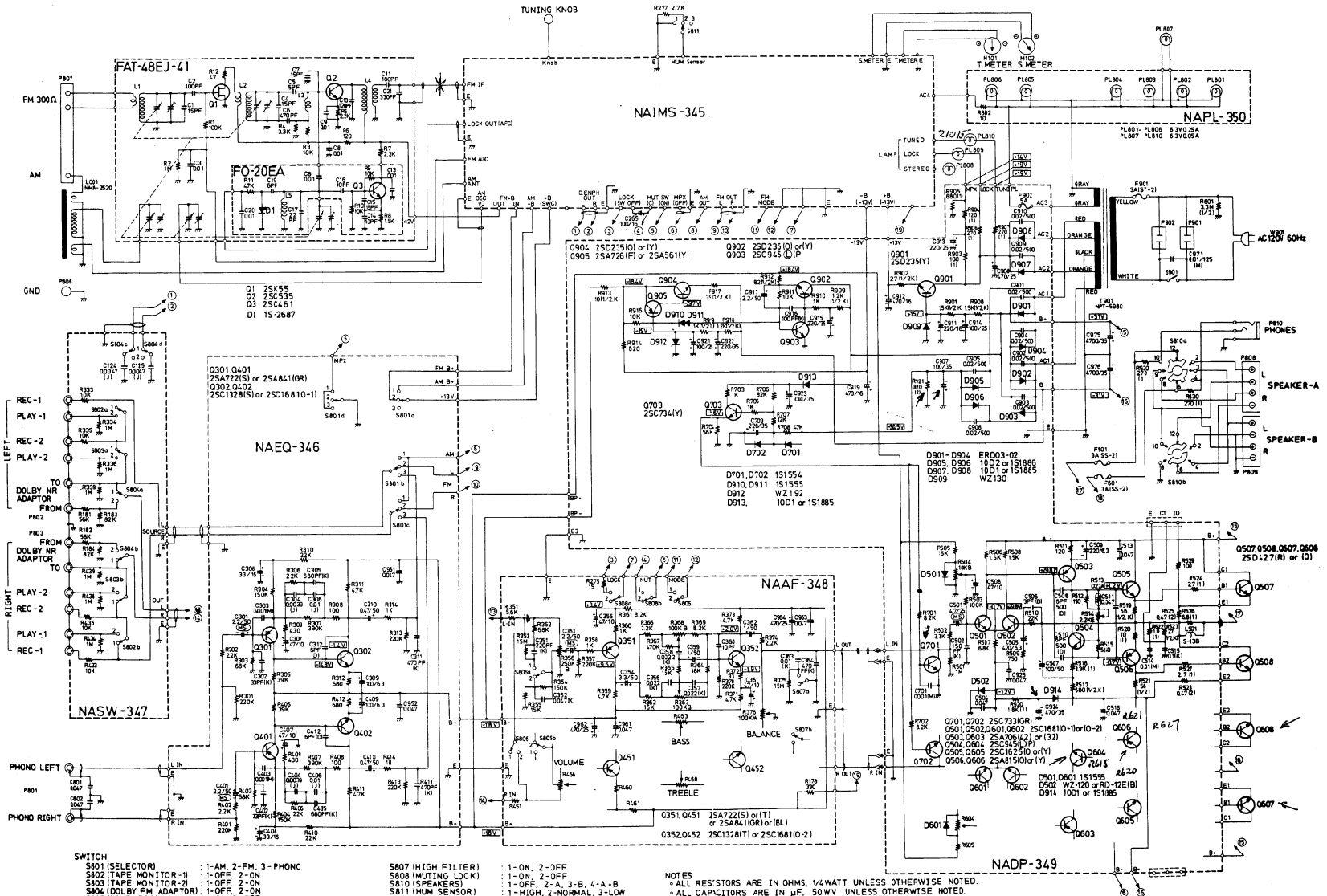


TX-2500 PARTS LIST

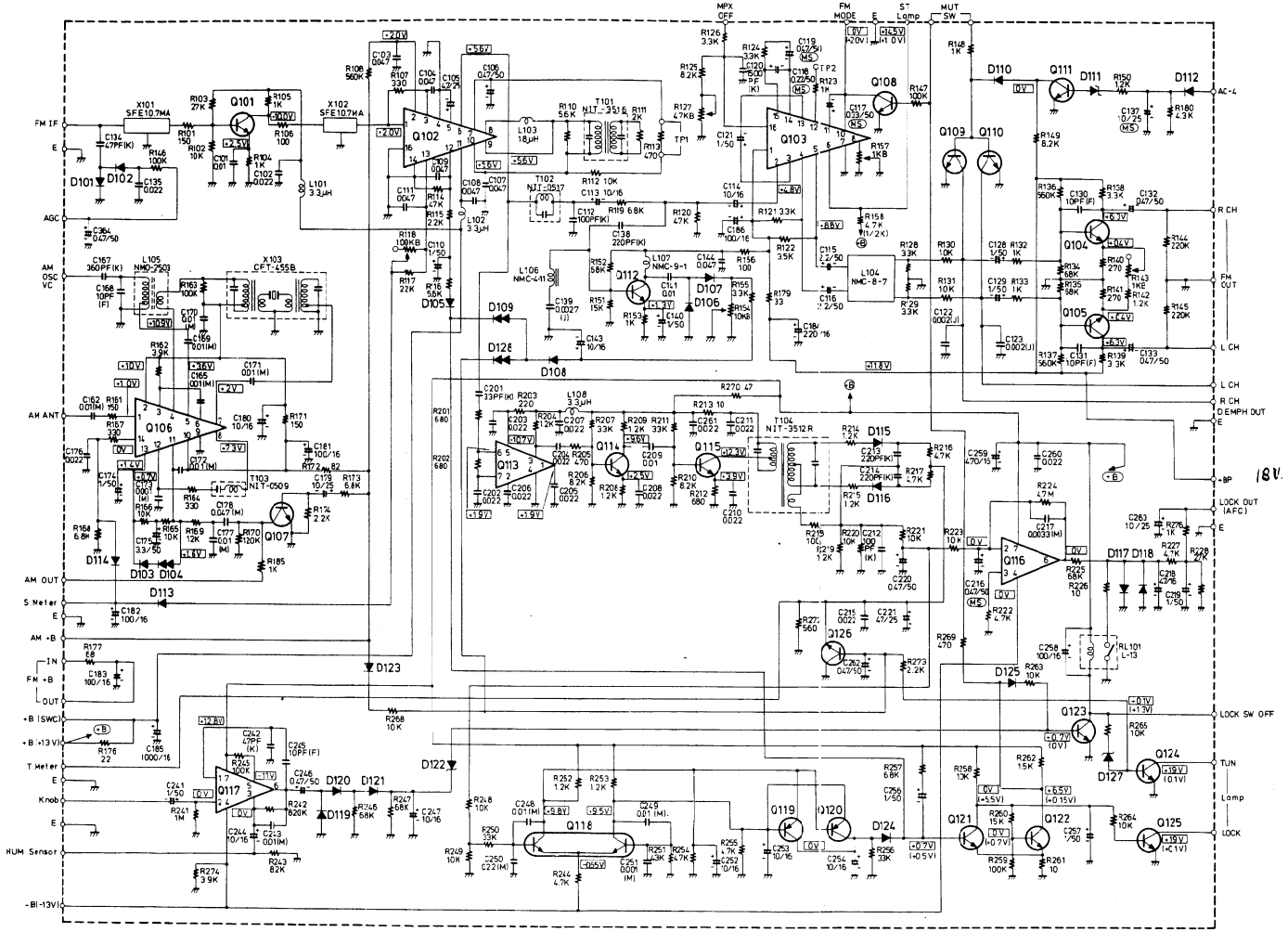
PARTS NO.	DESCRIPTION	SPECIFICATIONS	Q'TY	STOCK NO.	REMARKS
	FM Front End	FAT-48EJ-41	1	240036	
	Printed Circuit Board Ass'y	NAIMS-345	1	13809545	Tuner Ass'y
	Printed Circuit Board Ass'y	NAEQ-346	1	13809546	Equalizer Ass'y
	Printed Circuit Board Ass'y	NASW-347	1	13809547	Switch Ass'y
	Printed Circuit Board Ass'y	NAAF-348	1	13809548	Tone Ass'y
	Printed Circuit Board Ass'y	NADP-349	1	13809549	Driver Ass'y
	Printed Circuit Board Ass'y	NAPL-350	1	13809550	Pilot Lamp Ass'y
Q507,Q508,Q607,Q608	Transistor	2SD427(R) or 2SD427(O)	4	2200372 or 2200373	Use same hfe rank.
PL807-PL810	Pilot Lamp	6.3V0.05AW3	4	210015	Dial illumination
T901	Transformer-Power	NPT-598D	1	230156	
L001	Coil-Antenna	NMA-2520	1	232054	AM BAR ANTENNA
C971	Capacitor-UL	UL125V10000pF	1	3504012	
C975, C976	Capacitor-Elect.	CE62W35V4700μF	2	3504081	
C265	Capacitor-Elect.	CE04W16V100μF	1	352741011	
R530, R630	Resistor-Metal Oxide Film	RS1WBJ270ohm	2	441622714	
S901	Switch-Push	NPS-111LN5	1	25035025	Power Source
S810	Switch-Rotary	NRS-244-30Y	1	25030059	SPEAKERS
S811	Switch-Slide	NSS-2327	1	25065016	HUM SENSOR
P801	Pin Jack	NTM-2WPBL-E1	1	250170	Phono
P807	Terminal	NTM-3WPUN1	1	25060020	Antenna
P808, P809	Terminal-Speaker	NTM-4WPUN1	2	25060001A	
P810	Jack-Stereo Headphone	LJ-100-H	1	25045018	
P901, P902	Socket-AC	S-I6432	2	25050008A	
W901	Power Supply Cord	AS-UC	1	253072	
F901	Fuse	ST-2 3A	1	252005	Power Source
F901a	Fuse Holder	S-N1301	1	250080	
F501, F601	Fuse	SS-2 3A	2	252006	Speaker
F601a	Fuse Holder		1	25050004	with COVER
M101	Tuning Indicator	NIND-0250S52	1	243053	Strength
M102	Tuning Indicator	NIND-0500S55	1	243056	Tuning
Q507a, Q607a Q508a, Q608a	Socket-Transistor	M1614	4	250249	
	Binder	SKB-1	20	260208	
A001	Chassis		1	27100014B	
A003	Dial Drum		1	27200019	
A004	Spring-Drum	SP-14A	1	273803	
A005	Dial Cord			273903	
A007	Shaft-Push Switch		3	27260005	
A009	Joint		3	28320135	Push Switch
A032	Bracket-Dial Pulley (R)		1	27140084	
A033	Bracket-Dial Pulley (L)		2	27140083	
A034	Dial Pulley	DP-16N	4	27185002	
A040	Bracket-Front		1	27110024B	
A041	Drive Shaft		1	27205005	
A073	Back Panel		1	27120040	
A074	Bracket-Antenna		1	27140091	
A075	Holder-Antenna	1	1	27190015A	
A078	Heat Sink		1	27160016A	
A301	Amp. Box Ass'y		1	28110058B	
A302	Screw	4MS+15BS-Ni	4	82374015	
A303	Washer	4X12BS-Ni	4	870040	
((NAEQ-346))					
Q301, Q401	Transistor	2SA722(S) or 2SA841(GR)	2	2210915 or 2210665	
Q302, Q402	Transistor	2SC1328(S) or 2SC1681(O-1)	2	2210925 or 2210670	
C301, C401	Capacitor-LR or Capacitor-MS	LR04B50V2.2μF or MS04C50V2.2μF	2	392680221 or 392080227	
C307, C407	Capacitor-Elect.	CE04W10V47μF	2	352734701	
C308, C408	Capacitor-Elect.	CE04W16V33μF	2	352743301	
C309, C409	Capacitor-Elect.	CE04W6.3V100μF	2	352721011	
C310, C410	Capacitor Elect.	CE04W50V0.47μF	2	352784791	
S801	Switch-Rotary	NRS-163-30K	1	25030060	SELECTOR
((NASW-347))					
P802, P803	Pin Jack	NTM-6PBL-E1	2	25045019	
S802-S804	Switch-Push	NPS-122X2-142LA	1	25035031	T. MONI & DOLBY
((NAAF-348))					
Q351, Q451	Transistor	2SA841(GR)	2	2210665	
		2SA841(BL)		2210666	
		2SA722(S) or 2SA722(T)		2210915 or 2210916	
Q352, Q452	Transistor	2SC1681(O-2) or 2SC1328(T)	2	2210671 or 2210926	

PARTS NO.	DESCRIPTION	SPECIFICATIONS	Q'TY	STOCK NO.	REMARKS
C352, C452	Capacitor-DE	DE93M50V0.047μF	2	374124735	
C353, C453	Capacitor LR Capacitor MS	LR04B50V2.2μF MS04C50V2.2μF	2	392680221 392080227	
C354, C454	Capacitor-Elect.	CE04W50V3.3μF	2	352780331	
C355, C455	Capacitor-Elect.	CE04W10V47μF	2	352734701	
C361,C461,C359,C369	Capacitor-Elect.	CE04W50V1μF	4	352780101	
C962, C964	Capacitor-Elect.	CE04W25V470μF	2	352754711	
R356, R456	Resistor-Variable	N24RGP250KBT30.41C	1	5172042	VOLUME
R363,R463,R368,R468	Resistor-Variable	N16RGM100KB30.11C	2	5104036	TONE
R376, R476	Resistor-Variable	N16RL100KW30C	1	5104035	BALANCE
S805-S807	Switch-Push	NPS-122X3LA	1	25035032	LOW & HI FILTER, DOLBY
S808	Switch-Push	NPS-122LA7	1	25035029	MUTING
((NADP-349))					
Q501,Q502,Q601,Q602	Transistor	2SC1681(O 1) 2SC1681(O 2) or	4	2210670 or 2210671	Using same hfe rank
Q503, Q603	Transistor	2SA706(42) or (32)	2	2200033 or 2200034	
Q504, Q604, Q903	Transistor	2SC945 L (P)	3	2210743	
Q505, Q605	Transistor	2SC1625(O) or 2SC1625(Y)	2	2200393 or 2200394	Using same hfe rank
Q506, Q606	Transistor	2SA815(O) or 2SA815(Y)	2	2200403 or 2200404	Using same hfe rank
Q701, Q702	Transistor	2SC733(GR)	2	2210085	
Q703	Transistor	2SC734(Y)	1	2210064	
Q901	Transistor	2SD235(Y)	1	2200014	
Q902, Q904	Transistor	2SD235(O) or (Y)	2	2200013 or 2200014	
Q905	Transistor	2SA726(F) or 2SA561(Y)	1	2210416 or 2210074	
D501,D601,D910,D911	Diode-Silicon	1S1555	4	223105	
D502	Diode-Zener	WZ-120 or RD12E(B)	1	223910 or 223963	
D901-D904	Diode-Silicon	ERD03-02	4	223832	
D905, D906	Diode-Silicon	10D2	2	223805	
D907,D908,D913,D914	Diode-Silicon	10D1 or 1S1885	4	223801 or 223802	
D909	Diode-Zener	WZ-130	1	223924	
D912	Diode-Zener	WZ-192	1	223927	
D701, D702	Diode-Silicon	1S1554	2	223106	
L501, L601	Coil-S	S-1.3B	2	231001	
C501, C601	Capacitor MS or LR	MS04C25V4.7μF LR04B25V4.7μF or	2	392650471 392050477 or	
C503, C603	Capacitor-Elect.	CE04W10V47μF	2	352734701	
C505, C605	Capacitor-Elect.	CE04W6.3V470μF	2	352724711	
C507, C607	Capacitor-Elect.	CE04W50V100μF	2	352781011	
C509, C609	Capacitor-Elect.	CE04W6.3V220μF	2	352722211	
C515, C615	Capacitor-DE	DE93M50V0.1μF	2	374121045	
C703, C915, C923	Capacitor-Elect.	CE04W35V220μF	3	352762211	
C907	Capacitor-Elect.	CE04W35V100μF	1	352761011	
C908	Capacitor-Elect.	CE04W25V470μF	1	352754711	
C911	Capacitor-Elect.	CE04W16V220μF	1	352742211	
C912, C919	Capacitor-Elect.	CE04W16V470μF	2	352744711	
C913	Capacitor-Elect.	CE04W25V220μF	1	352752211	
C914, C921	Capacitor-Elect.	CE04W25V100μF	2	352751011	
C917	Capacitor-Elect.	CE04W50V2.2μF	1	352780221	
C924	Capacitor-Elect.	CE04W35V470μF	1	352764711	
R504, R604	Resistor-Semi Fixed	R-HK4.7KB3M	2	5225019	Center Voltage
R513, R613	Thermistor	D-22A	2	4000003	
R514, R614	Resistor-Semi Fixed	R-HK2.2KB3M	2	5225005	Idling Current
R516, R616	Resistor-Metal Oxide Film	RS1WBJ3.3Kohm	2	441623324	
R520,R522,R620,R622	Resistor-Metal Film	RNU1WCJ10ohm	4	451631004	
R524,R527,R624,R627	Resistor-Metal Film	RNU1WCJ2.7ohm	4	451630274	
R525,R528,R625,R628	Resistor-Metal Film	RNU2WCJ0.47ohm	4	451734794	
RQ526, RQ626	Resistor-Metal Film	RNU1WCJ6.8ohm	2	451630684	
R903	Resistor-Metal Oxide Film	RS1WBJ100ohm	1	441621014	
R904	Resistor-Metal Oxide Film	RS1WBJ120ohm	1	441621214	
R905	Resistor-Metal Oxide Film	RS1WBJ680ohm	1	441626814	
R906, R907	Resistor-Metal Oxide Film	RS1WBJ270ohm	2	441622714	
R920	Resistor-Metal Oxide Film	RS1WBJ1.8Kohm	1	441621824	
R921	Resistor-Metal Oxide Film	RS2WBJ820ohm	1	441728214	
	Radiator	RAD 01	7	270187-1	
F902	Fuse	5A-T	1	252020	
F902a	Fuse Holder	SN5051	2	250113	
((NAPL-350))					
PL801-PL806	Pilot Lamp	6.3V0.25A	6	210026	
	Fuse Holder	SN5051	12	250113	

TX-2500 CIRCUIT DIAGRAM



NAIMS-345 (TX-2500) CIRCUIT DIAGRAM

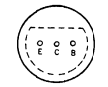


Q101, Q114, Q115 ------- 2SC380(O)
Q102 ------------ HA1137
Q103 ------------ LA-3350
Q104, Q105 ------- 2SC1312(F)
Q106 ------------ HA11151
Q107, Q108, Q111 ---- 2SC945 (L) Q
Q109, Q110, Q121-Q126 -- 2SC1317(R) or 2SC735(Y)
Q112 ------------ 2SC733(BL)
Q113 ------------ TA-7051AP
Q116 ------------ TA-7504S
Q117 ------------ TA-7136P
Q118 ------------ 2SC1583(G)
Q119, Q120 ------- 2SA726(F)

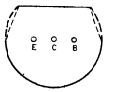
D101, D102, D106, D107 ---
D110, D112-D116, D108 --- 1N60 (N) FM
D119, D120, D123 ---
D103, D105, D117 ---
D118, D121, D124, D125 --- 1S1555
D104, D109, D128 ------ VD1212
D111 ------------ RD5.1EB or WZ-052
D122 ------------ RD4.7EB or YZ-047
D127 ------------ RD5.6EC or WZ-061

NOTES;
- ALL RESISTORS ARE IN OHMS, ¼WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF, 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (—⊕—) ARE IN μF/WV.
- VOLTAGE (MEASURED WITH V.T.V.M)
  - ⊐⊐ NO INPUT SIGNAL
  - ( ) FM STEREO

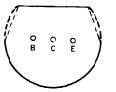
Semiconductors
Bottom View



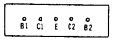
2SA561 2SC735
2SA841 2SC1681
2SC380



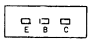
2SA722
2SC945
2SC1317
2SC1328



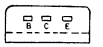
2SA 726
2SC1312



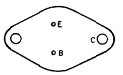
2SC1583



2SA 706
2SC1124

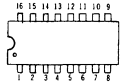


2SA 815
2SC1625
2SD 234
2SD 235

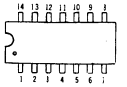


2SD426

IC PIN NO.
TOP VIEW



LA3350
HA1137



HA1151

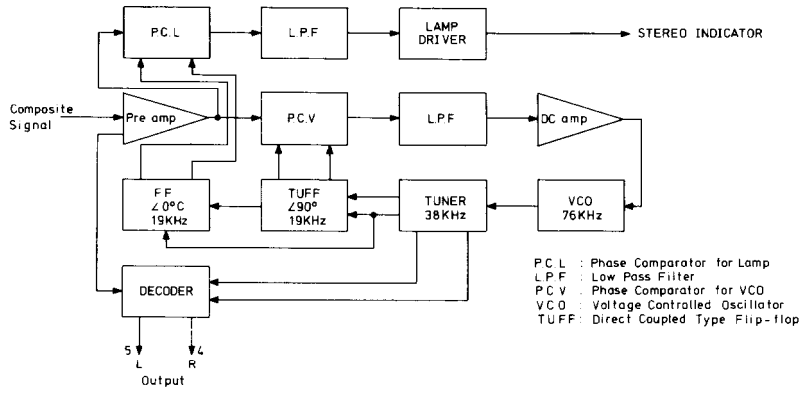
PIN NO.

TA7504S
TA7136P
TA7061AP

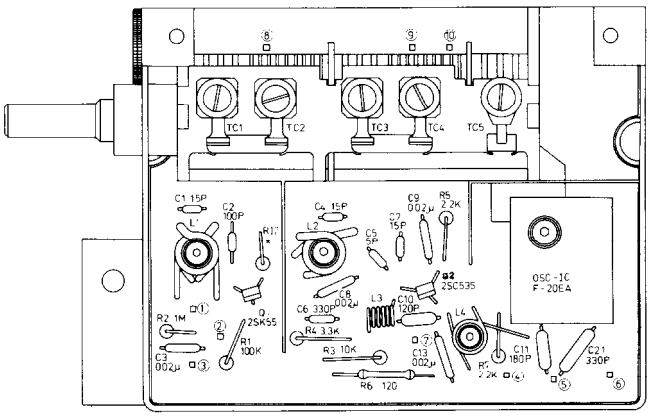
NAIMS-345 PARTS LIST

PARTS NO.	DESCRIPTION	SPECIFICATIONS	Q'TY	STOCK NO.	REMARKS
Q101, Q114, Q115	Transistor	2SC380(O)	3	2210123	
Q104, Q105	Transistor	2SC1312(F)	2	2210136	
Q107, Q108, Q111	Transistor	2SC945ⓁQ	3	2210745	
Q109, Q110, Q121–Q126	Transistor	2SC1317(R) or 2SC735(Y)	8	2210943 or 2210244	
Q112	Transistor	2SC733(BL)	1	2210086	
Q118	Transistor	2SC1583(G)	1	2210707	Twin transistor
Q119, Q120	Transistor	2SA726(F)	2	2210416	
Q102	IC	HA–1137	1	222421	Quadrature Detector
Q103	IC	LA–3350	1	222449	MPX IC
Q106	IC	HA–1151	1	222418	AM IC
Q113	IC	TA–7061AP	1	222402	FM IF IC
Q116	IC	TA–7504S	1	222424	OP Amp
Q117	IC	TA–7136P	1	222423	Sensor Amp
D101,D102,D110,D106–D108 D112–D116,D119,D120,D123	Diode–Germanium	1N60ⓃFM	14	2231031	
D103,D105,D117,D118,D121 D124,D125	Diode–Silicon	1S1555	7	223105	
D104, D109, D128	Varistor	VD1212	3	4000022	
D111	Diode–Zener	RD5.1EB or WZ–052	1	223945 or 224012	
D122	Diode–Zener	RD4.7EB or YZ–047	1	223943 or 224011	
D127	Diode–Zener	RD5.6EC or WZ–061	1	223948 or 223928	
L101, L102, L108	Choke Coil	NCCH–1501 (3.3μH)	3	233024	
L103	Choke Coil	NCCH–1506 (18μH)	1	233074	
L104	MPX Coil	NMC–8–7	1	233032	Low Pass Filter
L105	OSC Coil	NMO–2503	1	232013	AM OSC Coil
L106	MPX Coil	NMC–4–11	1	233018	
L107	MPX Coil	NMC–9–1	1	233031	
T101	Transformer–IF	NIT–3516	1	233083	FM DET
T102	Transformer–IF	NIT–0517	1	233084	10.7MHz Trap
T103	Transformer–IF	NIT–0509	1	232041	AM DET
T104	Transformer–IF	NIT–3512R	1	233075	FM DET
X101, X102	Ceramic Filter	SFE10.7MA(BLUE, RED or ORANGE)	2	3010007,3010006 or 3010008	FM IF Filter
X103	Ceramic Filter	CFT–455B	1	3010012	AM IF Filter
C105	Capacitor–Elect.	CE04W25V4.7μF	1	352750471	
C106,C132,C133,C136,C220,C246	Capacitor–Elect.	CE04W50V0.47μF	6	352784791	
C110,C121,C219,C257,C128 C129,C241,C140,C174,C256	Capacitor–Elect.	CE04W50V1μF	10	352780101	
C112,C114,C262,C253,C145 C244,C252,C254	Capacitor–Elect.	CE04W16V10μF	8	352741001	
C115, C116	Capacitor–Elect.	CE04W50V2.2μF	2	352780221	
C175	Capacitor–Elect.	CE04W50V3.3μF	1	352780331	
C179, C263	Capacitor–Elect.	CE04W25V10μF	2	352751001	
C180	Capacitor–Elect.	CE04W16V10μF	1	352741001	
C181,C182,C258,C183,C186	Capacitor–Elect.	CE04W16V100μF	5	352741011	
C184	Capacitor–Elect.	CE04W16V220μF	1	352742211	
C185	Capacitor–Elect.	CE04W16V1000μF	1	352741021	
C218	Capacitor–Elect.	CE04W16V47μF	1	352744701	
C221	Capacitor–Elect.	CE04W25V47μF	1	352754701	
C259	Capacitor–Elect.	CE04W16V470μF	1	352744711	
C117	Capacitor–MS	MS04C50V0.33μF	1	392083397	
C118	Capacitor–MS	MS04C50V0.22μF	1	392082297	
C137	Capacitor–MS	MS04C25V10μF	1	392051007	
C119, C216	Capacitor–MS or LR	MS04C50V0.47μF or LR04B50V0.47μF	2	392084797 or 392684791	
C178	Capacitor–DE	DE93M50V47000μF	1	374124737	
C250	Capacitor–DE	DE93M50V220000μF	1	374122247	
R118	Resistor–Semi Fixed	R–HK100KB3P	1	5225013	STRENGTH METER
R127	Resistor–Semi Fixed	R–H4.7KB3M	1	5225019	19KHz
R154	Resistor–Semi Fixed	R–HK10KB3P	1	5225017	MUTING LEVEL
R157	Resistor–Semi Fixed	N10HR1KBD	1	5225024	SEPARATION
PL101	Relay	L–13	1	25065026	AFC

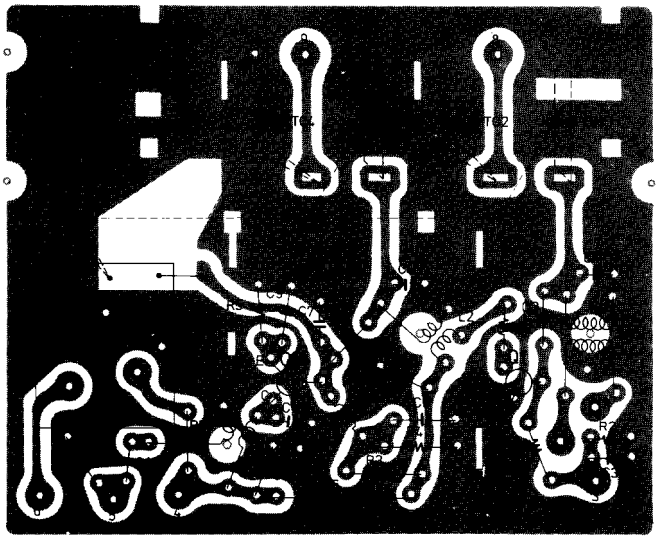
LA-3350 BLOCK DIAGRAM



FRONT END BOARD VIEW
FAT-48EJ-41(TX-2500)
TOP VIEW



BOTTOM VIEW



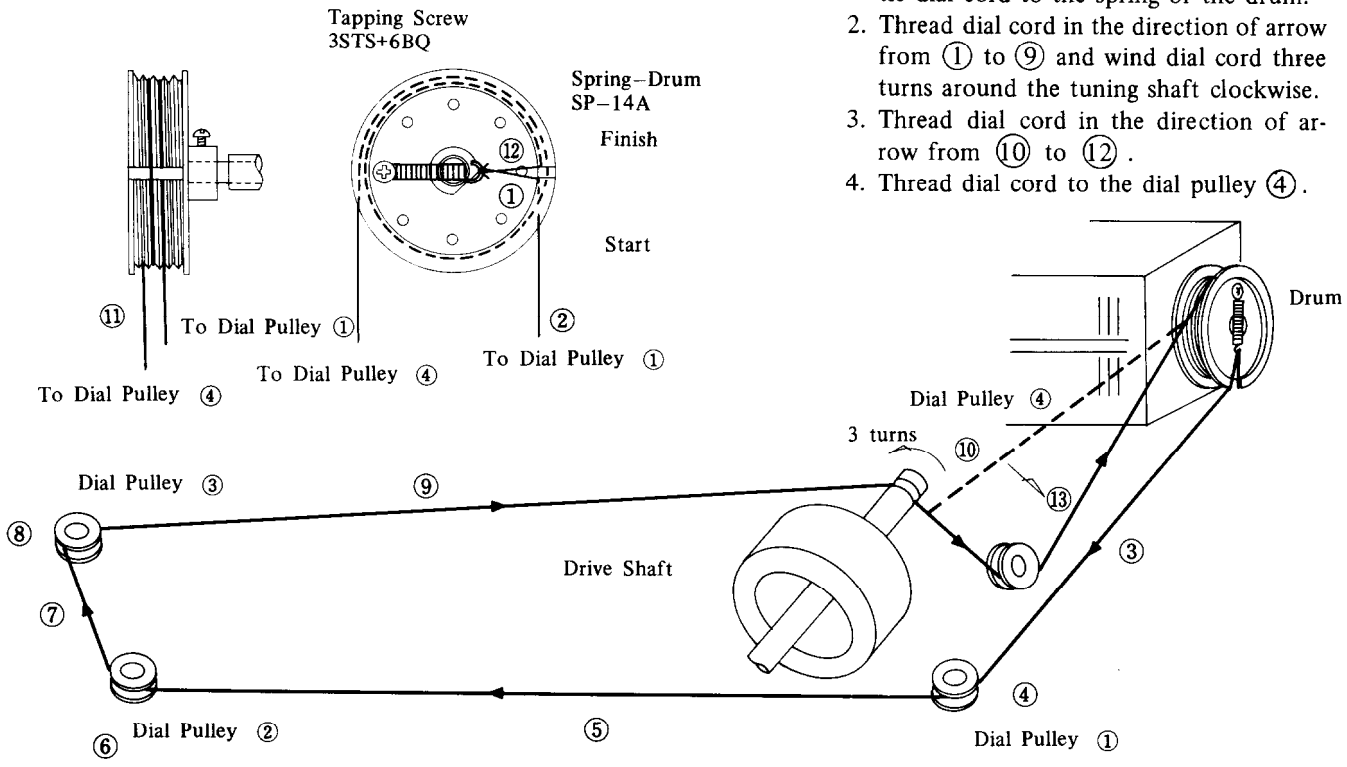
PARTS NO.	DESCRIPTION	SPECIFICATIONS	STOCK NO.	REMARKS
Q1	Transistor (FET)	2SK55(D)	2210954	RF Amp.
Q2	Transistor	2SC535(B)	2210882	Mixer
	OSC Block	FO-20EA		

Terminals

1. ANT (300-ohm)
2. ANT (300-ohm)
3. AGC
4. +B
5. IF OUT (600-ohm)
6. AFC
7. FM. E
8. AM. RF
9. AM. OSC
10. AM. E

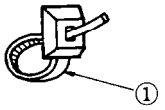
DIAL CORD ARRANGEMENT

1. Close the variable capacitor complete and tie dial cord to the spring of the drum.
2. Thread dial cord in the direction of arrow from ① to ⑨ and wind dial cord three turns around the tuning shaft clockwise.
3. Thread dial cord in the direction of arrow from ⑩ to ⑫.
4. Thread dial cord to the dial pulley ④.



SERVICE PROCEDURE

RELEASING BINDER



Fig–A

the state in which it stays

Fig–B

a small driver or a fine pin

fig- 29

A little space opens up in between the teeth as the part (1) is pressed slightly in the same direction as in tightening, as shown in fig--29, the binder can come off with the driver or pin having the pointed end being pushed up in the direction as shown by the arrow.

USEING SENSOR SWITCH

While the sensor SW is ordinarily set to LOW position when the unit is delivered, there may be occasions when the sensitivity of the inductive ham detection device is lessened as one of the coaxial cables is earthed with the aerial in joint use. Only in this or similar case is the sensor SW allowed to be brought to HIGH position.

REMOVING TUNING KNOB

Being fixed in position on the shaft with the 4 mm enamel screw, the tuning knob should be taken off by the use of a hexagonal driver.